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ABSTRACT

With this volume, the Council of Chief State School Officers introduces a new 2-year format for state education indicators. The first section of this report is an analysis of state-level data related to the first-ever state-by-state achievement results from the 1990 mathematics assessment of the National Assessment of Educational Progress (NAEP). The analysis includes background characteristics, program inputs and policies, and educational outcomes. The second section of the report provides profiles of each state on a number of available indicators. Several states are still presenting a mathematics curriculum that heavily emphasizes numbers, operations, and measurement over concepts in geometry and algebra functions. The analysis also makes it apparent that states differ widely in the proportion of teachers who are certified in middle school or secondary school mathematics, and that these teachers vary widely in their college preparation. Findings also indicate that use of calculators does not deter students' mathematical thinking and that grouping students for instruction does not significantly affect mathematics proficiency. A final finding is that the availability of instructional materials and resources is related to mathematics proficiency. Eleven figures and 10 tables in an appendix present study findings. State profiles are included. (Contains 17 references.) (SLD)

[illegible] EDUCATION [illegible]

[illegible] and [illegible] Related to State Policies and Practices

The Council of Chief State School Officers (CCSSO) is a nationwide non-profit organization of the 57 public officials who head departments of public education in every state, the District of Columbia, the Department of Defense Dependents Schools, and five extra-state jurisdictions. CCSSO seeks its members' consensus on major education issues and expresses their views to civic and professional organizations, to federal agencies, to Congress, and to the public. Through its structure of standing committees and special task forces, the Council responds to a broad range of concerns about education and provides leadership on major education issues.

Because the Council represents each state's chief education administrator, it has access to the educational and governmental establishment in each state and to the national influence that accompanies this unique position. CCSSO forms coalitions with many other education organizations and is able to provide leadership for a variety of policy concerns that affect elementary and secondary education. Thus, CCSSO members are able to act cooperatively on matters vital to the education of America's young people.

The State Education Assessment Center leads efforts by states individually and collectively to enhance the breadth, quality, and comparability of information about education and to improve the use of that information by educators, educational policy-makers, and the public. The Center conducts projects to develop the consensus frameworks for state-by-state testing in the National Assessment of Educational Progress. It also runs consortia in student and teacher assessment to help states collaborate in the development of state-of-the-art assessments. It encourages the establishment of standards for American education, so these assessment programs can be anchored on fundamental societal judgements of what students should learn. The Center also conducts projects to improve statistics and other indicators of how well the school systems are doing in preparing students.

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Introduction

With this volume, we introduce a new, two-year format for State Education Indicators. This year we have prepared a new analytical report. The first section is an analysis of state-level data related to the first-ever state-by-state achievement results—from the 1990 NAEP mathematics assessment. The analysis includes a comprehensive set of educational indicators: background characteristics, program inputs and policies, and educational outcomes. The second section of the report provides profiles of each state on a number of available indicators. Next year, we will issue a compendium of key state statistics organized by indicator as we have reported state indicators since 1987.

The decision to try this two-year format was guided by several factors. First, we convened meetings of advisors who recommended producing a more analytical report. Second, because the field of educational assessment, indicators, and accountability has progressed, it is now possible to undertake a more sophisticated analysis. Third, we believed it was now possible to provide interpretations and conclusions beyond earlier attempts.

The states have the major role in policy decisions to advance educational quality. They have a decade and a half of policy-based reform efforts and are moving to "systemic" strategies aimed at comprehensive state, local and school actions.

We search for interpretations and causal relationships between programs, characteristics and results, yet there are great limitations in analysis of what works based on mixed and partial sets of indicators. Good data are available in some areas but not others. We are working with fewer than forty states and other jurisdictions (participating in the 1990 NAEP), limiting the conclusions that can be reached. Indicators are different from tightly designed research in the conclusions they can support. Nevertheless, it is important to look at results at the state level in relation to the conditions under which they are obtained, to try to discover what works and what does not.

The first part of this report attempts to do this. Working from the 1990 NAEP mathematics results for several states, we try to find patterns in characteristics related to the achievement results. Are high or low performing states different in the extent to which they seem to cover aspects of the curriculum? Are teacher qualifications and experiences different? How should we factor in socioeconomic differences? Some preliminary interpretations are reached. But, the limitations of these interpretations must be understood. This is a pioneering attempt to analyze factors related to achievement results in one subject from the states' perspective.

John Dossey drafted the analysis and worked with us in preparing this section of the report. We very much appreciate his contribution. State data-collection staff and other experts have reviewed the report. We will appreciate comments or suggestions readers can provide. We hope this new format achieves the purpose of adding value to indicators in informing policy decisions.

RAMSAY SELDEN

CADELLE HEMPHILL

ROLF BLANK

What Do the NAEP Math Results *Mean for States?*

In school mathematics the United States is an underachieving nation, and our curriculum is helping to create a nation of underachievers. We are not what we ought to be; we are not even close to what we can be. It is a time for change—a time to renew school mathematics in the United States.

McKNIGHT ET AL., 1987

By the year 2000, U.S. students will be first in the world in science and mathematics achievement.

ALEXANDER, 1991

The national focus on educational reform has often centered on school mathematics. This scrutiny is a result of several factors. The first is undoubtedly the crucial role that the mathematics curriculum plays as distributor of opportunity. This opportunity to learn mathematics is tightly tied to a child's opportunities in life (Steen, 1989). A second factor is the leading role that the mathematics education profession has played in the development of standards for curriculum, evaluation, and teaching. The development, release, and growing acceptance of the National Council of Teachers of Mathematics' (NCTM) *Curriculum and Evaluation Standards for School Mathematics* (1989) and the *Professional Standards for Teaching Mathematics* (1991) have provided a focus for reform. A third reason for the centrality of mathematics education in reform is the number of recent comparative studies of international achievement in mathematics (Husen, 1967; Travers & Westbury, 1989; Robitaille & Garden, 1989; Lapointe, Mead, & Phillips, 1988; Lapointe, Mead, & Askew, 1992), as well as recent results from the National Assessment of Educational Progress (NAEP) in mathematics (Dossey, Mullis, Lindquist, & Chambers, 1988; Mullis, Dossey, Owen, & Phillips, 1991).

This report examines data on the mathematical education of American 8th graders, working from a state-level perspective. It examines 1990 NAEP data collected in both the assessment of the nation

[1] *John Dossey, Professor of Mathematics at Illinois State University, was the primary author of this section, with assistance from Rolf Blank, CCSSO/SEAC.*

and the trial assessment of the states (Mullis et al., 1991), supplemented with information on state programs and other state characteristics drawn from other sources.

The NAEP proficiency data cover student performance in five content areas of mathematics: numbers and operations; measurement; geometry; data analysis, statistics, and probability; and algebra and functions. The test items were developed and reviewed by mathematics educators, measurement specialists, and representatives of the states involved in the trial state assessment. These items were administered to nearly 7,000 students in public and private schools nationally and to approximately 2,500 8th grade students drawn from about 100 schools in each of 40 participating states and territories (Mullis et al., 1991).

The resulting data provide perhaps the strongest indicators, to date, of the health of U.S. school mathematics and the factors that help shape it. Special emphasis is given in the analyses reported here to the nature of the 8th grade curriculum, to teachers' backgrounds, to the schools' instructional programs, and to the policy contexts in which students' mathematics education takes place in the states. These variables were selected based on patterns in the national NAEP results and questions raised by them in the mathematics education and policy communities (Mullis et al., 1991). These also are factors that are under the control of state policymakers.

CURRICULUM

From the time of the First International Mathematics Study (Husen, 1967), there has been a great deal of interest in the influence of student opportunity to learn, or curriculum coverage, on achievement. A variety of measures has been used to assess student curricular exposure since that time (Robitaille & Garden, 1989; Travers & Westbury, 1989). A major facet of the opportunity-to-learn question is not only the coverage but the "intensity" given a topic during a year of study. Results of the Second International Mathematics Study (McKnight et al., 1987) suggest that beyond opportunity, in general, the ability of a country to focus heavy emphasis on a topic of instruction within a year may be preferable to diffusing the same amount of instruction over a period of years. That is the pattern in countries that do better in achievement. At the 8th grade level in the United States, the breadth of the curriculum must be expanded to encompass more topics than the historical emphasis on arithmetic (numbers and operations) and measurement. The NCTM *Standards* call for all students to see a mathematics curriculum that also considers data analysis, geometry, and the study of algebra and functions (NCTM, 1989).

Teacher Emphasis on Areas of Mathematics

In the 1990 NAEP Mathematics Assessment, teachers of the 8th grade students in the study were asked to indicate the degree to which they had given heavy, moderate, or little or no emphasis in their mathematics instruction curriculum to: numbers and operations; measurement; data analysis and statistics; geometry; and algebra and functions. The initial report of the results showed that at the national level there is a strong association between the topics teachers emphasize and student proficiency in those areas (Mullis et al., 1991). Students tend to do better in one of those five areas when teachers emphasize it, whether it is numbers and operations or algebra and functions. In other words, we tend to do better where we place our effort.

The NAEP data were analyzed by state to determine if there are patterns among the states in teacher emphasis on areas of the math curriculum and to determine if these differences by state are related to differences in student math proficiency.

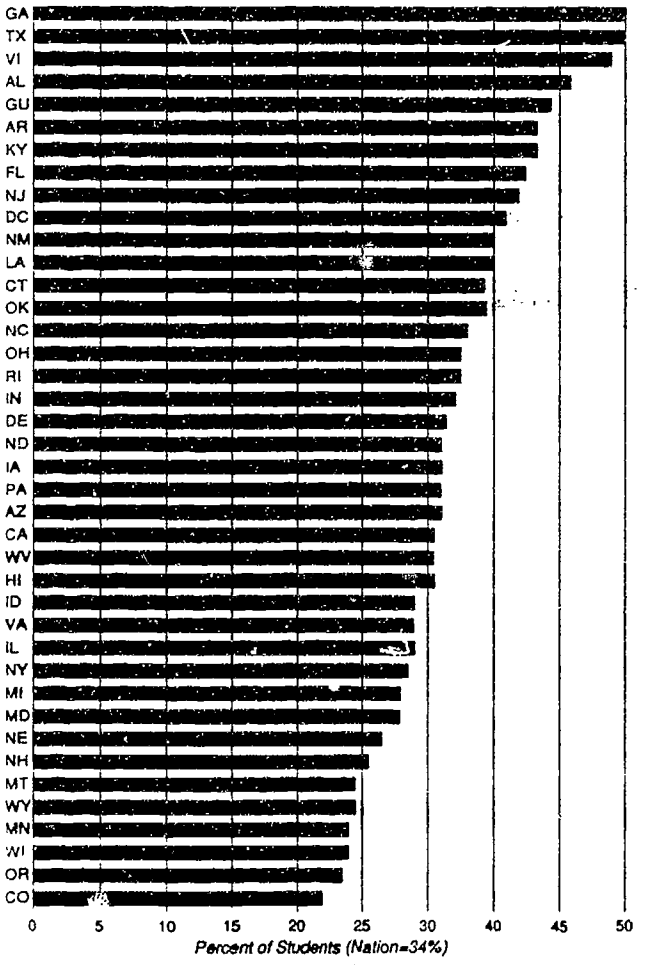
First, several of the curriculum areas were found to be interrelated. The state-level analysis showed a strong correlation ($r = .93$) between the percentage of students receiving heavy emphases in numbers/operations and in measurement. There is also a high correlation ($r = .81$) between the percentage of students recciving heavy emphases in geometry and in algebra/functions. States providing large percentages of their students with heavy emphases in *both* numbers/operations and measurement may be offering rather traditional programs of study, while those giving heavy emphasis to the geometry and algebra/ functions areas at the 8th grade level may be moving toward a richer, more ambitious program of study, similar to that called for by the *Standards*.

Results of the state-by-state analysis of the 1990 NAEP data showed that the relative emphasis that teachers in a state give to different areas of the 8th grade math curriculum is strongly related to the level and type of math proficiency of students in the state. Figure 1 shows an ordering of states according to the level of teacher emphasis on numbers/operations and measurement. Eight states or territories gave the largest proportions of their students a heavy emphasis in numbers/ operations and measurement: Georgia, Texas, the Virgin Islands, Alabama, Guam, Arkansas, Kentucky, and Florida, in decreasing order. The eight states giving the lowest proportion of their students a heavy emphasis in these areas were Colorado, Oregon, Wisconsin, Minnesota, Wyoming, Montana, New Hampshire, and Nebraska.

Figure 2 shows the proportion of students in a state receiving heavy emphasis in numbers/ operations and measurement, with the states ordered according to the *state rank on the average math proficiency score* (see Table 1 in the Appendix for state scores). The state percentages for emphasis on numbers/operations and measurement are expressed by quintile averages. The bar graph shows that states with higher proficiency tend to have fewer students receiving heavy

Figure 1

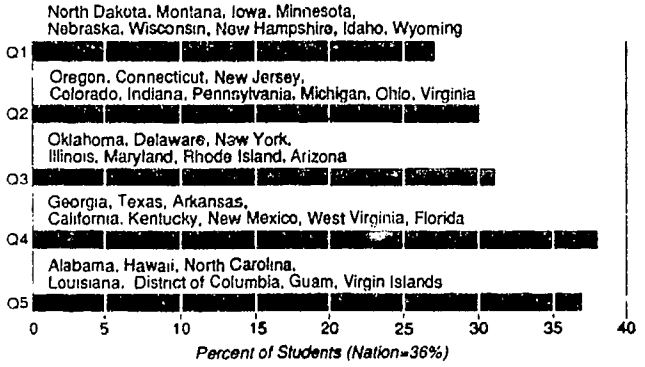
Percent of Students with Teachers Emphasizing Numbers/Operations and Measurement



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

Figure 2

Percent of Students with Teachers Emphasizing Numbers/Operations and Measurement by State Rank on Overall Math Proficiency *(Quintile [Q] Average)*



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emphasis on numbers/ operations and measurement (correlation = -.632, which is significant at the .05 level of statistical significance). The states in the top quintile of math proficiency (North Dakota, Montana . . . Wyoming had an average of 27 percent of students receiving curriculum emphasis on numbers/operations and measurement, while the states in the bottom quintile of math proficiency (Alabama, Hawaii . . . the Virgin Islands) had an average of 37 percent of students receiving emphasis in these areas.[2]

Figure 3 shows the results of ordering states according to the percentage of students whose teachers reported heavy emphasis on geometry and algebra/functions. The eight states reporting the most emphasis on these areas of the curriculum were New Jersey, Texas, New York, Montana, Illinois, North Dakota, New Mexico, and Georgia. (Some states report high emphasis in both "types" of curriculum.) The eight states giving the lowest average emphasis to these areas were Hawaii, Arkansas, West Virginia,

[2] *The statistical analysis of NAEP results by state showed that the socioeconomic status (SES) background of students is strongly related to average math proficiency and to curriculum emphasis of teachers, and the average SES of students in a state can account for most of the variance in math proficiency. The analysis in this section attempts to show differences in curriculum emphasis of teachers by state, with the understanding that at least part of the state differences are due to the influence and expectations of parents and the school community (represented by a measure of SES).*

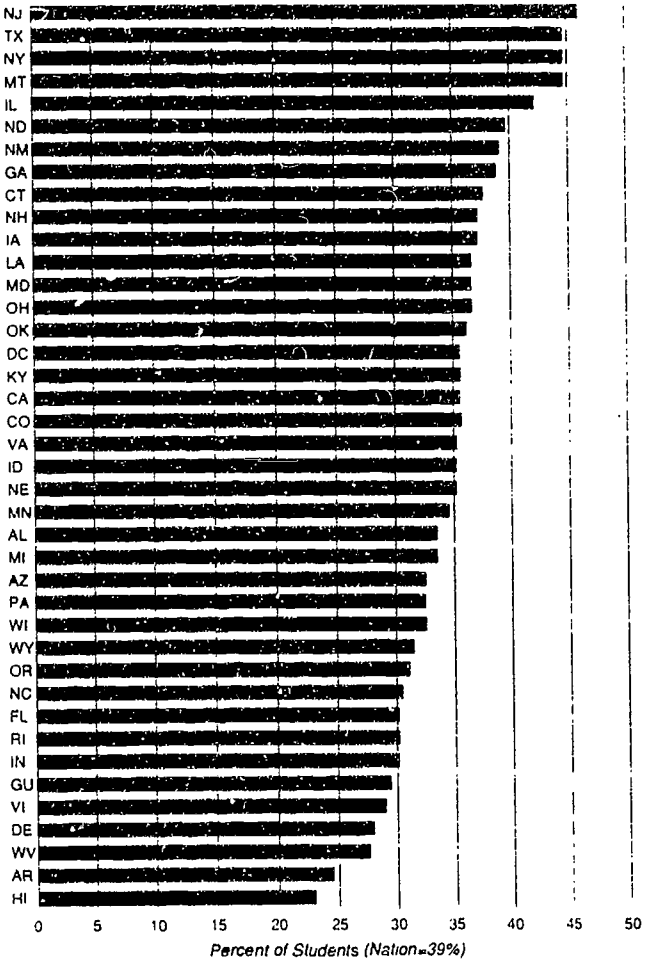
Delaware, the Virgin Islands, Guam, Indiana, and Rhode Island.

What can be determined about the relationship between teachers' curriculum emphasis and student performance? Figure 4 shows the proportion of students receiving heavy emphasis on geometry and algebra/functions, *with the states ordered according to average math proficiency score*. The bar graph indicates that states with higher proficiency tend to have more students receiving heavy emphasis on geometry and algebra/functions (correlation = .335, which is significant at the .05 level of statistical significance). The states in the top quintile of math proficiency had an average of 37 percent of students receiving curriculum emphasis on geometry and algebra/functions, whereas the states in the bottom quintile of math proficiency had an average of 31 percent of students receiving emphasis in these areas.

A third step in looking at the relationship between math curriculum emphasis and student proficiency is a statistical "cluster analysis" (Wilkinson, 1989). We used such an analysis to look at the relationship between three variables: a) average state math proficiency, b) the percentage of students who receive heavy emphasis on numbers/ operations and measurement, and c) the percentage of students who receive heavy emphasis on geometry and algebra/ functions.

Figure 3

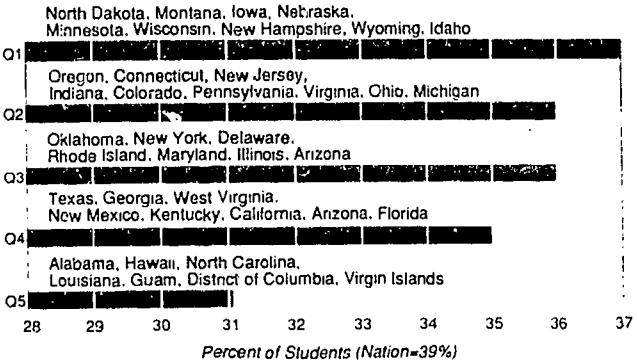
Percent of Students with Teachers Emphasizing Geometry and Algebra/Functions



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

Figure 4

Percent of Students with Teachers Emphasizing Geometry and Algebra/Functions by State Rank on Overall Math Proficiency (*Quintile [Q] Average*)



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992

The results revealed that states fell into three clusters. The first cluster had *low* reported teacher emphasis on numbers/operations and measurement and *medium* reported emphasis on geometry and algebra/functions. The average math proficiency of states in cluster one was significantly higher (mean = 269) than the average for states in the other two clusters. The 10 states with the highest math proficiency overall were in this cluster: North Dakota, Montana, Iowa, Nebraska, Minnesota, Wisconsin, New Hampshire, Wyoming, Idaho, and Oregon.

States in the second cluster had *more* emphasis than those in cluster one on numbers/operations, measurement, and geometry and algebra/functions and *lower* average math proficiency (mean = 253). The states in cluster three had *medium* emphasis on numbers/operations and measurement and *low* emphasis on geometry and algebra/functions and also had lower average math proficiency (mean = 254) than states in cluster one. Thus, the results of the state-level analysis show that curriculum emphasis in the classroom seems to be related to differences in student math proficiency as tested in NAEP.

TEACHER PREPARATION IN MATHEMATICS

NAEP provides several useful indicators of the extent to which teachers are prepared to teach 8th grade mathematics. One indicator of particular relevance for states is the percentage of teachers with state certification in mathematics. Virtually all teachers are certified to teach in some field or grade level. This analysis considers the role of teacher certification specifically in mathematics for teachers teaching mathematics.

Preparation for teaching mathematics at the 8th grade level falls at a critical juncture in the design of teacher education and certification. In most states, teachers of 8th grade mathematics are required to have some mathematics education beyond that of the basic elementary education degree (which is usually two mathematics content courses and one course in the methods of teaching mathematics), but the typical state does not require a minor or major in mathematics (Blank & Dalkilic, 1992). The *Professional Standards for Teaching Mathematics* (NCTM, 1991) recommend that 8th grade teachers have a broad range of coursework in mathematics content.

To measure teachers' preparation against this standard, the NAEP teacher questionnaire asked teachers about their certification status and their collegiate coursework in seven areas of mathematics and computer science: number systems and numeration, geometry, probability and statistics, abstract or linear algebra, calculus, computer science, and computer programming.

Type of Teacher Certification

Figure 5 shows the percentage of students in each state taught by teachers with a certification in either secondary mathematics or middle grades mathematics. The NAEP data indicate that almost all states have more than 98 percent of teachers that are certified to teach at the 8th grade level (see Table 3 in the Appendix), but there is considerable difference among the states in the proportion of teachers that are certified in mathematics. Nationally, 84 percent of 8th grade students were taught by a teacher certified in mathematics, either in secondary or middle grades mathematics. The state percentages vary from a high of over 96 percent in Minnesota, Indiana, and Rhode Island to 52 percent in the Virgin Islands and 41 percent in Arizona.

These data indicate that many states have a large portion of their students taught by teachers meeting state standards for preparation. But if a state has more state-certified teachers in mathematics, is there any relationship to the math proficiency of students? A statistical analysis was conducted with these two variables, and the results showed there was a statistically significant, positive relationship.[4] Figure 6 illustrates the pattern—that states with more certified teachers in math tend to have higher average math proficiency. The states in the top quintile of math proficiency had an average of 86 percent of students being taught by teachers certified in mathematics, whereas the states in the bottom quintile of math proficiency had an average of 75 percent of students receiving instruction from math-certified teachers. This finding indicates that states should carefully examine the relationship of their certification policies to preparation of 8th grade math teachers and should consider how certification standards might affect the quality of teachers' mathematics instruction.

A further step was taken in this state-level analysis: to examine the connections among teacher certification, student proficiency, and the socioeconomic-status (SES) background of students. Research has consistently shown that SES of students is strongly related to their educational achievement. In this case, it is important to test whether the SES level of the state accounts for the relationship between teacher certification and student proficiency.

In the NAEP state-by-state analysis, the percent of students with at least one parent who is a college graduate was used as a proxy for SES. The analysis showed that state SES is strongly related to math proficiency, as well as to the proportion of teachers certified in mathematics. Almost all of the relationship of teacher certification in mathematics to state math proficiency can be accounted for by average SES

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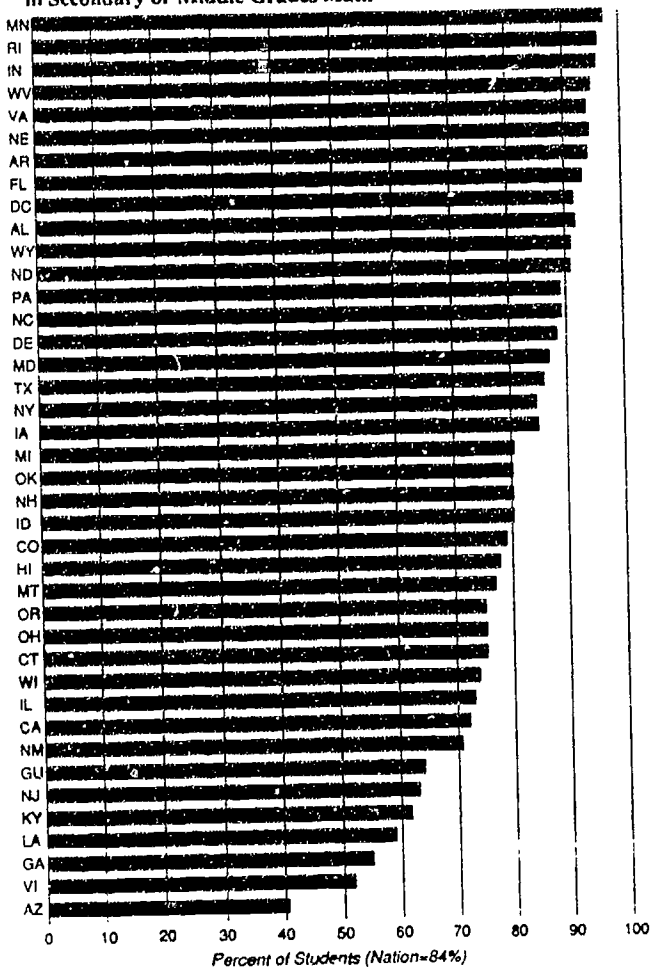
[4] $F = 4.25$, $p < .05$, with 40 percent of the variance in state math proficiency explained by the state percent of teachers certified in mathematics

[5] Using a multiple-regression analysis, 67 percent of the variance in state math proficiency was explained by percent of students having at least one parent a college graduate and the percent of students having a teacher certified in secondary or middle grades mathematics. The effect of college-educated parents was statistically significant ($p = .019$), while the role of teachers certified in mathematics was not ($p = .159$).

Figure 5

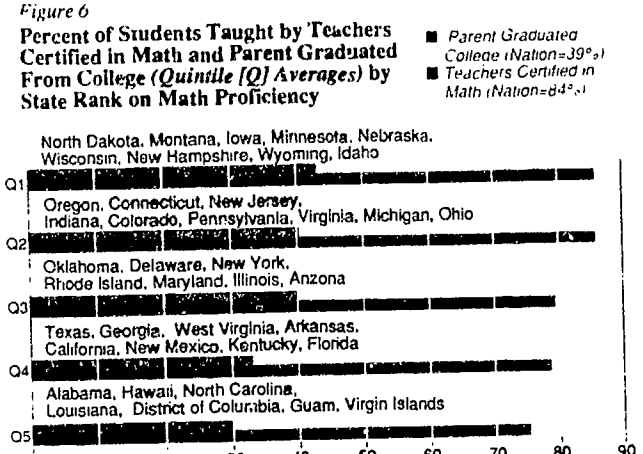
Percent of Students Taught by Teachers Certified in Secondary or Middle Grades Math



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

Figure 6

Percent of Students Taught by Teachers Certified in Math and Parent Graduated From College *(Quintile [Q] Averages)* by State Rank on Math Proficiency



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of students.[5] One explanation of this finding is that schools in states with higher average SES (more college-educated parents) tend to hire more math-certified teachers, and these states' students have higher math scores. Put another way, higher SES states have higher achievement and significantly greater percentages of students learning from teachers who are certified in mathematics.

Mathematics Coursework of Teachers

A second indicator of teacher preparation for mathematics teaching is college coursework in mathematics and, specifically, the amount of coursework in the seven areas recommended by the NCTM 1991 *Professional Standards for the Teaching of Mathematics*. Nationally, the amount of math coursework taken by teachers has a positive relationship to student mathematics proficiency (Mullis et al., 1991). As a national average, 52 percent of 8th grade students had math teachers with at least one mathematics course in each of six or seven recommended areas. Students who have teachers with coursework in six or seven of the mathematics areas have a significantly higher mathematics proficiency (271) than do students who have teachers with coursework in four or five areas (263) or zero to three areas (262).[6]

[5] *Difference of means significant at the .001 level of statistical significance. This finding indicates a correlation between teachers' coursework in math and students' math proficiency, but there may be other factors that may account for the relationship. For example, students with higher achievement entering 8th grade may be assigned to teachers with more coursework in mathematics.*

The state-level data on mathematics coursework of teachers show that 7 of the 10 states with the highest average math proficiency had rates of teachers' completing coursework in six or seven areas that were above the national average. Three of the high-scoring states, North Dakota, Minnesota, and Nebraska, had over 70 percent of their students being taught by teachers with coursework in six or seven areas (see Table 4 in the Appendix). Conversely, 7 of the 10 states with the lowest average math proficiency had less than 50 percent of students being taught by teachers with coursework in six or seven areas.

Coursework in Methods of Teaching Mathematics

Another measure of teachers' performance in the classroom is their knowledge of the methods of teaching math at the 8th grade level. As part of the NAEP assessment, teachers reported the number of courses in methods of teaching mathematics that they had completed. The 1990 results indicate that nationally 28 percent of 8th grade students had teachers who had no coursework in the teaching of mathematics; at the other extreme, 20 percent of 8th grade students had teachers with three or more methods courses.

Nationally, these differences did not translate into higher or lower student math scores on NAEP. The average math proficiency level by methods coursework were: no courses—261, one course—261, two courses—262, and three or more courses—256.

The state-level analysis also showed no relation between the average number of methods courses in mathematics and average state math proficiency (see Table 5 in the Appendix for state data). Thus, state differences in amount of teacher coursework in math teaching methods are not related to average student performance. It is possible that the *quality* of preparation and teachers' knowledge of how to teach 8th grade mathematics does make a difference, but the current NAEP questionnaire does not collect this information.

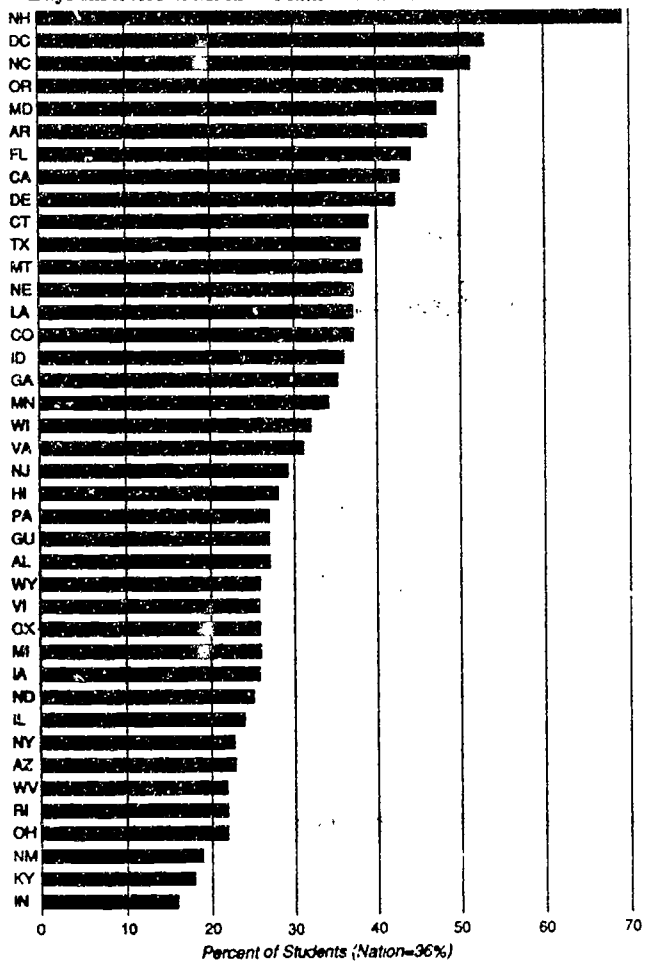
Teacher Inservice Education in Mathematics

A third measure of teacher preparation in mathematics is the amount of teacher inservice education in mathematics instruction. Continuing professional development for teachers of mathematics could help teachers maintain their knowledge base and provide them with appropriate skills for using that knowledge to improve teaching.

The NAEP teacher survey asked teachers to report the number of hours of inservice education they had received in math or math education in the past year. The responses were categorized as the percent taking 16 hours or more (2 or more days), 1 to 15 hours (1-2 days), or none. Figure 7 shows for each state the percentage of students with teachers who received two or more days of inservice in math or math education. The state percentages vary from a high of 69 percent in New Hampshire to a low of 16 percent in Indiana. The national average was 36 percent of students being taught by teachers who received at least two days of math inservice education.

Figure 7

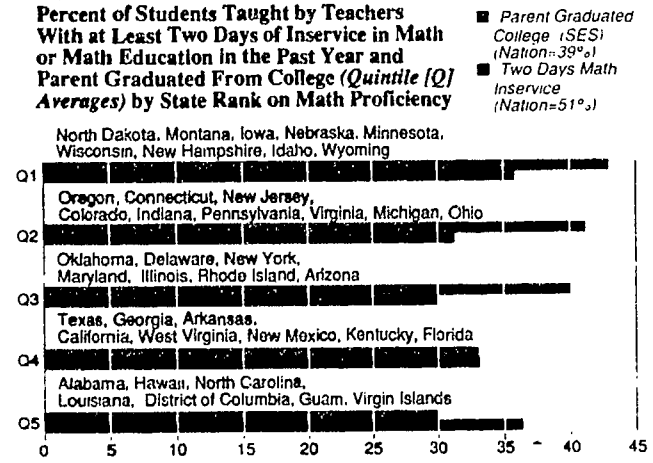
Percent of Students Taught by Teachers With at Least Two Days Inservice in Math or Math Education in the Past Year



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

Figure 8

Percent of Students Taught by Teachers With at Least Two Days of Inservice in Math or Math Education in the Past Year and Parent Graduated From College *(Quintile [Q] Averages)* by State Rank on Math Proficiency



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The state-level analysis examined the relationship between percent of teachers who had two or more days of math inservice and students' average math proficiency. Figure 8 shows the states ranked by math proficiency and quintile averages for level of teachers' inservice. The statistical analysis indicates there is a significant relationship.[7] The states in the top quintile of math proficiency had an average of 36 percent of students being taught by teachers with two or more days of math inservice education in the prior year, and the bottom quintile of math proficiency also had an average of 36 percent. The three quintiles between had slightly lower levels of teacher inservice.

The average SES of the states was also considered in this analysis. The results show there is a strong interrelationship between a state's level of parent education and the amount of teacher inservice in mathematics. The connection between teacher inservice training and student achievement is no longer significant after SES is factored out. States with higher average SES (parent education) tend to have better prepared teachers through inservice education, as well as through initial preparation; and this higher level of preparation seems to be associated with student learning in mathematics.

[7] *$F = 3.784$, $p < .05$, with 17 percent of the variance in state math proficiency explained by the state level of teacher inservice in math.*

Another finding from the state analysis is that several states with relatively low overall mathematics proficiency may be trying to address the situation through increased teacher inservice in mathematics. For example, over 40 percent of teachers in California, Florida, Arkansas, North Carolina, and the District of Columbia had at least two days of inservice in the past year. Subsequent analyses of NAEP results could determine whether these efforts have an effect in improving student performance. Also, future NAEP assessments could explore whether specific types or approaches to inservice education are particularly effective and related to higher student achievement.

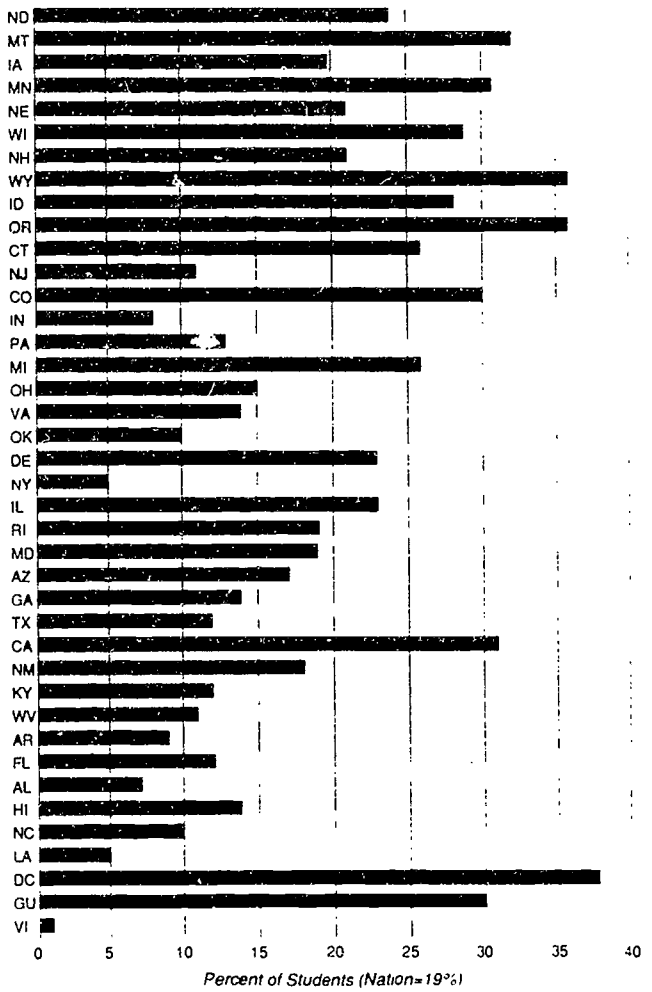
CLASSROOM INSTRUCTIONAL PRACTICES

Two features of classroom instruction in mathematics have been major topics of discussion and analysis recently: use of calculators and use of ability grouping (Hembree & Dessart, 1986; Oakes & Lipton, 1992). At issue with calculators is whether the technology lessens or improves students' ability to critically think and learn to solve problems. Critics charge that grouping, under the guise of tracking to meet anticipated abilities, has limited students' opportunities to learn and shuttled many students into dead-end tracks within the curriculum.

Use of Calculators

Nationwide, 19 percent of the 8th grade students in 1990 had unrestricted use of hand calculators in their mathematics classrooms, and 24 percent were permitted use of calculators on tests. The mean NAEP score of students having access to calculators (280) was significantly higher than the score for students with restrictions (263).

Figure 9
Percent of Students Allowed Unrestricted Use of Calculators in Math Class by State Rank on Math Proficiency

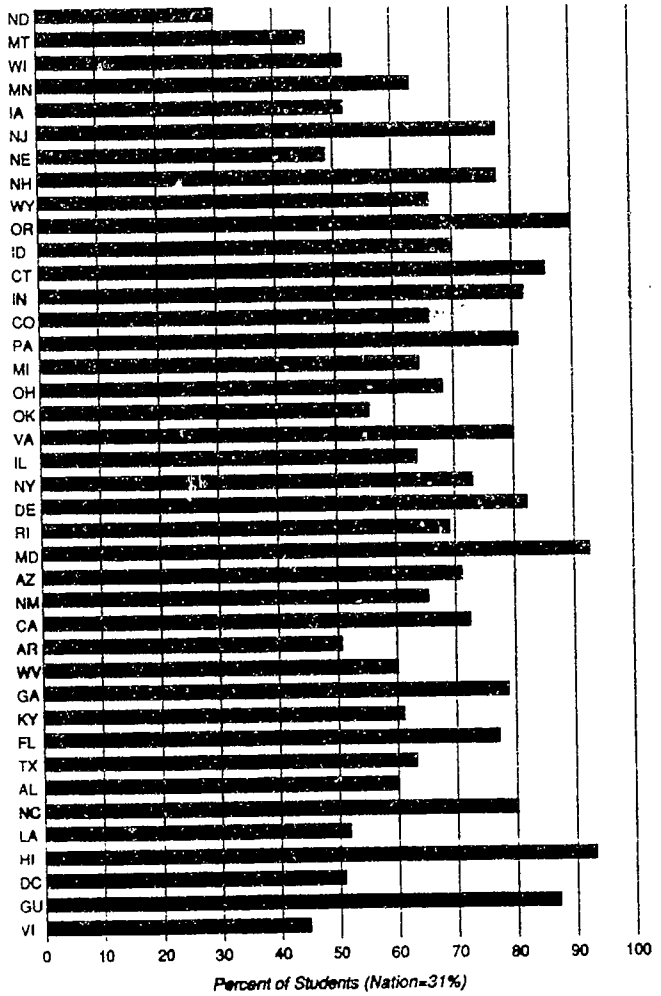


Source: U S Department of Education National Center for Education Statistics "The State of Mathematics Achievement NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States" June 6 1991 Council of Chief State School Officers, State Education Assessment Center, Washington D C., Fall 1992

This indicates that students who have access to calculators as part of their daily learning of mathematics are learning more and are not disadvantaged when asked on tests to compete with students who have only used paper and pencil. A large portion of the assessment required these calculator-friendly students to

Figure 10

Percent of Students Instructed in Ability Groups in Math Class by State Rank on Math Proficiency



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

work without their calculators during the NAEP tests.

Figure 9 shows the relationship of overall state math proficiency and the percent of students allowed unrestricted use of the calculator in mathematics class at the 8th grade level. There is a significant positive relationship. Eleven of the top 12 states in overall student math proficiency had at least 20 percent of their students reporting unrestricted use of calculators in their mathematics classes, with a mean of 26 percent. Nine of the 12 states with the lowest overall math proficiency had less than 15 percent of their students with unrestricted use of calculators, with a mean of 16 percent.[a]

Grouping for Instruction

The effects of grouping by ability also can be explored at the state level through the NAEP results. Overall, 66 percent of 8th grade math students were taught by teachers who reported grouping students by ability. The percent of students taught math in ability groups varied from 30 percent in North Dakota to 93 percent in Hawaii. The state-level analysis revealed a nonsignificant, negative correlation (r = -.06) between the percentage of students in a state that were grouped by ability and the average state mathematics proficiency.[b] In Figure 10, the states in the top quintile of math proficiency had an average of 56 percent of students being taught in ability groups, whereas the states in the bottom quintile of math proficiency had an average of 67 percent of students taught in ability groups. State differences in the extent of ability grouping are not related to average math proficiency. This finding suggests that at the state level, the practice of grouping students for instruction, whether or not it involves tracking into different curricular levels, has not had significant effects on overall student performance.

[a] *The national average for math proficiency of students taught in grouped classes (270) was slightly higher than the math proficiency of students in nongrouped classes (258).*

[b] *Difference of means significant at the .02 level of statistical significance.*

There are different purposes for grouping students. Some kinds of grouping sort students into classes with students performing at different levels, but do not limit their continuation into algebra and other college preparatory coursework. However, if the grouping practice is a major factor in determining who gets into algebra and other advanced math courses, the practice can be damaging. The NAEP data do not permit these two types of grouping to be disentangled, but the overall lack of a relationship between the rate of grouping by ability and state math proficiency indicates that the practice and effects of grouping need to be reexamined by school decision makers.

INSTRUCTIONAL RESOURCES AND MATERIALS

State policies and programs are major factors in determining the level of resources that local educators have available to provide and improve instruction and learning. Two ways of measuring the relationship of state resources to student math proficiency were analyzed. One was to compare differences in state spending on education. A second method was to measure the availability of resources in the classroom according to teachers' perceptions of what is needed.

Expenditures on Education

Average per-pupil expenditures by state are compiled annually and reported by the National Center for Education Statistics. The average expenditure varies by state from $3,000 to over $7,000 per pupil (including cost-of-living adjustments). Per-pupil expenditures were analyzed in relation to state NAEP math proficiency, and the analysis showed no significant relationship between average expenditure by state and average math proficiency[10] (see Table 9 in the Appendix for state data).

This finding is consistent with other research that has shown that at aggregate levels, such as states and districts, the gross measure of average expenditures is not statistically related to a measure of student achievement. Average state expenditure masks large differences in education expenditures within states and districts (Barton, Coley, & Goertz, 1991). Also, differences in average expenditure do not reveal differences in staff, facilities, and materials that are purchased, and whether these resources produce differences in classrooms. These more direct measures of resource quality related to expenditures are not available in NAEP. However, the NAEP teacher questionnaire does include an item on teachers' perceptions of the resources and materials in their classrooms.

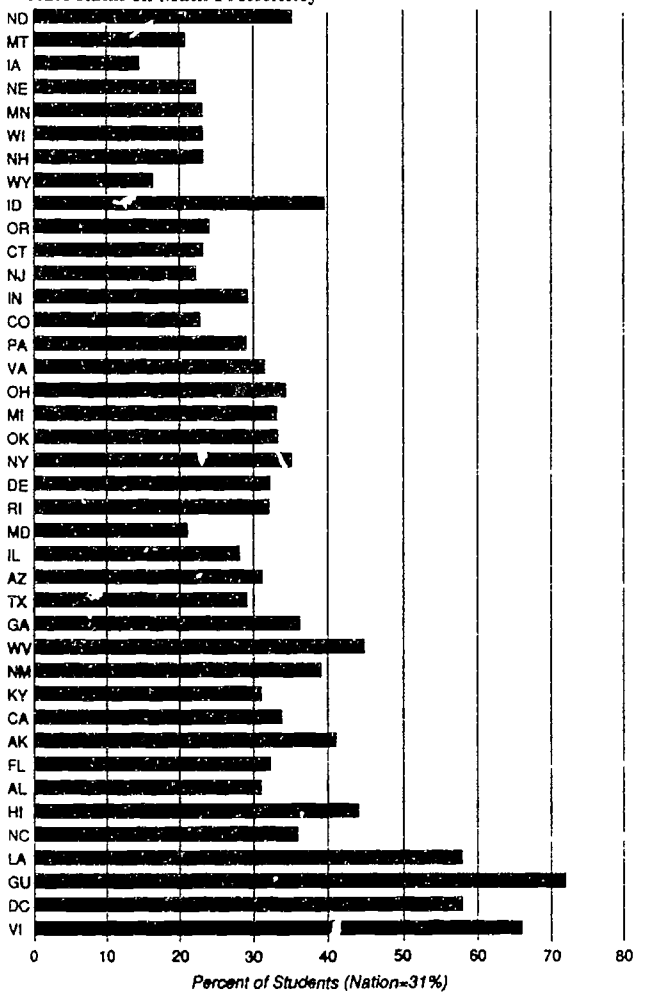
[10] $F = .034, p > .85$.

Teachers' Perception of Availability of Materials

A second indicator of state resources for mathematics education is based on the responses of 8th grade math teachers. The NAEP teacher questionnaire asked "How well supplied are you by your school system with the instructional materials and other resources you need to teach your class?" This measure is more subjective than expenditures, but it is also more direct, because it addresses the classroom-level availability of specific, needed resources.

Figure 11

Percent of Students Taught by Teachers Reporting They Get Some or None of the Materials and Resources They Need by State Rank on Math Proficiency



Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

Nationally, teachers of 31 percent of 8th grade students reported they "get some or none" of the materials and resources they need; whereas 13 percent said they received "all" the materials and resources they need, and 56 percent said they received "most" of what they need. The level of a shortage of materials and resources varied by the socioeconomic level of the school community—only 10 percent in advantaged urban schools, but 40 percent in disadvantaged urban schools and 31 percent in rural schools (29 percent in schools in other areas).

The state NAEP analysis examined the relationship of average state math proficiency to teachers' perceptions of the availability of math materials and resources. There is a strong correlation ($r = -.861$) between average state math proficiency and the state's percentage of students with teachers who perceive they have some or none of the instructional materials and resources they need, as illustrated in Figure 11. The states in the top quintile of math proficiency had an average of 24 percent of students with teachers reporting some or no materials and resources, while the states in the bottom quintile of math proficiency had an average of 52 percent of students with teachers reporting this problem. The state percentage of teachers reporting a shortage of materials and resources is correlated with the state SES.

States with less than 25 percent of students with teachers reporting a lack of materials and resources were Wyoming, Iowa, Oregon, Wisconsin, Colorado, New Hampshire, Connecticut, Minnesota, Nebraska, New Jersey, Maryland, and Montana. Ten of these states were among the 12 states with the highest average NAEP math proficiency. The states with over 45 percent of students with teachers citing a lack of resources were Louisiana, West Virginia, Hawaii, and Arkansas; and these states were all among the lowest 10 states on overall math proficiency. Guam, the District of Columbia, and the Virgin Islands were also in the over-45-percent category.

MAJOR FINDINGS

This analysis of the 1990 state-by-state trial assessment data has brought to light a number of relationships.

First, several states are still presenting a large percentage of their students a mathematics curriculum that heavily emphasizes numbers and operations and measurement topics over concepts in geometry and algebra functions. The association with NAEP achievement results suggest that such programs may result in lower student performance in 8th grade mathematics. Since student achievement in mathematics at the 8th grade level is often a key to future opportunities in high school math and science, state and district policy makers should carefully analyze the NAEP results for their state and the implications of the data for their math curriculum.

Second, states differ widely in the proportion of teachers who are certified in either middle school or secondary school mathematics. The data suggest that students taught by teachers certified in mathematics have higher proficiency than those with teachers with only a certification in elementary education.

Third, mathematics teachers at the 8th grade level also have vastly different levels of college mathematics coursework. In some states, as many as 70 percent of teachers have taken coursework in all of the areas recommended by NCTM; whereas in other states, fewer than 30 percent have met this guideline.

The relationship of calculator use in the classroom to math proficiency was a fourth finding from the 1990 NAEP data. The state-level analysis showed that states where students are allowed to use calculators in class and on tests had significantly higher math proficiency than those where students are denied such use in testing situations. NAEP did not allow using calculators on over 60 percent of its items. Thus, the results support other research showing that the use of calculators on a regular basis does not deter students' mathematical thinking. To the contrary, there was evidence that unrestricted calculator use is associated with higher mathematical proficiency.

Fifth, the state-level results showed that grouping students for instruction was not significantly related to overall mathematics proficiency among the states. Although students in high-ability classes generally scored higher on the NAEP assessment, overall state proficiency was not related to higher state percentages of students grouped by ability.

Finally, the availability of instructional materials and resources, as reported by teachers, was found to be related to student math proficiency. States with more teachers who say they lack resources and materials for teaching math have lower overall math proficiency as assessed by NAEP.

Appendix

Table 1

Overall Mathematics Proficiency and Percent of Students Receiving Heavy Emphasis in Content Areas by State

	Mathematics Proficiency	Numbers/ Operations (%)	Measurement (%)	Geometry (%)	Data Anal./ Statistics (%)	Algebra/ Functions (%)
ALABAMA	252	58	24	26	11	41
ARIZONA	259	52	10	14	7	51
ARKANSAS	256	60	17	16	9	33
CALIFORNIA	256	40	21	25	17	46
COLORADO	267	37	7	20	14	51
CONNECTICUT	270	41	28	27	16	48
DELAWARE	261	43	20	17	17	39
DISTRICT OF COLUMBIA	231	47	25	25	31	46
FLORIDA	255	56	19	18	16	42
GEORGIA	258	57	33	30	24	47
GUAM	231	55	24	22	12	37
HAWAII	251	46	15	17	9	29
IDAHO	272	48	10	14	9	56
ILLINOIS	260	41	17	29	14	55
INDIANA	267	55	9	15	4	45
IOWA	278	48	14	25	4	49
KENTUCKY	256	58	19	25	15	46
LOUISIANA	246	57	13	14	11	59
MARYLAND	260	35	21	22	14	51
MICHIGAN	264	44	12	20	10	47
MINNESOTA	276	36	12	19	8	50
MONTANA	280	40	9	31	13	58
NEBRASKA	276	41	12	19	8	51
NEW HAMPSHIRE	273	36	15	27	16	47
NEW JERSEY	269	50	24	37	14	55
NEW MEXICO	256	54	16	25	14	53
NEW YORK	261	44	13	40	24	49
NORTH CAROLINA	250	49	17	17	13	44
NORTH DAKOTA	281	49	13	23	9	56
OHIO	264	48	17	23	13	50
OKLAHOMA	263	58	11	17	5	55
OREGON	271	34	13	19	17	43
PENNSYLVANIA	266	47	15	17	6	48
RHODE ISLAND	260	52	13	17	10	43
TEXAS	258	61	29	37	20	52
VIRGIN ISLANDS	218	53	35	11	11	47
VIRGINIA	264	46	12	18	10	52
WEST VIRGINIA	256	48	13	14	8	41
WISCONSIN	274	37	11	17	8	48
WYOMING	272	42	7	15	6	48
NATION	**261**	**49**	**17**	**28**	**14**	**46**

Source: U.S. Department of Education, National Center for Education Statistics, The State of Mathematics Achievement: NAEP's [illegible] Mathematics Assessment of the Nation and the States, [illegible] Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

Table 2

Overall Mathematics Proficiency and Average Heavy Emphases Reported for Students by State

Table 3

Percent of Students Having Teachers Who Are Certified in Education (Elementary or Middle Grades) or Mathematics (Middle Grades or Secondary) and Percent Having Teachers Who Are Certified in Mathematics

	Mathematics Proficiency	Numbers/Operations & Measurement (%)	Geometry & Algebra (%)	Certified Education or Math (%)	Certified Math (%)
ALABAMA	252	41	34	99	92
ARIZONA	259	31	33	93	41
ARKANSAS	256	39	25	96	94
CALIFORNIA	256	31	36	96	72
COLORADO	267	22	36	96	79
CONNECTICUT	270	35	38	96	75
DELAWARE	261	32	28	99	88
DISTRICT OF COLUMBIA	231	36	36	98	92
FLORIDA	255	38	30	99	93
GEORGIA	258	45	39	99	55
GUAM	231	40	30	100	64
HAWAII	251	31	23	91	78
IDAHO	272	29	35	97	80
ILLINOIS	260	29	42	99	73
INDIANA	267	32	30	99	96
IOWA	278	31	37	97	85
KENTUCKY	256	39	36	98	62
LOUISIANA	246	35	37	96	59
MARYLAND	260	28	37	97	87
MICHIGAN	264	28	34	98	81
MINNESOTA	276	24	35	99	98
MONTANA	280	25	45	100	77
NEBRASKA	276	27	35	99	94
NEW HAMPSHIRE	273	26	37	96	80
NEW JERSEY	269	37	46	99	63
NEW MEXICO	256	35	39	99	71
NEW YORK	261	29	45	95	85
NORTH CAROLINA	250	33	31	97	89
NORTH DAKOTA	281	31	40	96	91
OHIO	264	33	37	100	75
OKLAHOMA	263	35	36	99	80
OREGON	271	24	31	95	75
PENNSYLVANIA	266	31	33	98	89
RHODE ISLAND	260	33	30	99	96
TEXAS	258	45	45	96	86
VIRGIN ISLANDS	218	44	29	75	52
VIRGINIA	264	29	35	98	94
WEST VIRGINIA	256	31	28	97	95
WISCONSIN	274	24	33	97	74
WYOMING	272	25	32	100	91
NATION	**261**	**36**	**39**	**96**	**84**

Tables 2, 3, 4, and 5 Source: U S Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States " June 6 1991 Council of Chief State School Officers State Education Assessment Center Washington, D C , Fall 1992

Table 4

Percent of Students Having Teachers Who Have Mathematics Courses in Some of the Recommended Areas for 8th Grade Teachers

6 or 7 Areas (%)	4 or 5 Areas (%)	0 to 3 Areas (%)
46	40	14
30	27	43
41	41	18
41	29	30
66	22	12
35	38	28
52	35	14
79	13	8
40	31	29
38	29	33
26	42	32
52	31	17
51	27	21
36	33	31
71	23	7
54	28	18
25	30	45
36	28	36
56	30	14
39	34	26
85	13	2
59	24	17
69	19	12
55	24	21
42	26	33
44	35	21
57	26	14
43	28	29
74	15	12
46	26	29
30	41	29
51	29	20
60	27	13
63	29	8
39	42	19
52	29	19
56	31	13
45	36	19
50	24	26
65	24	11
52	**29**	**19**

Table 5

Percent of Students by State Having Teachers Who Have Taken Three or More, Two, One, or No Courses in the Methods of Teaching Mathematics and the Associated Mathematics Proficiencies of Those Students

Three or More (%)	Two Courses (%)	One Course (%)	No Course (%)	Three or More	Two Courses	One Course	No Course	
21	18	33	28	252	250	254	253	ALABAMA
19	14	27	40	265	260	260	257	ARIZONA
17	18	34	31	253	253	258	257	ARKANSAS
31	20	21	28	259	255	258	253	CALIFORNIA
27	18	34	22	268	270	265	265	COLORADO
25	19	29	27	271	270	270	269	CONNECTICUT
19	23	32	27	260	265	260	263	DELAWARE
39	21	28	13	228	231	225	250	DISTRICT OF COLUMBIA
21	14	43	22	259	255	256	253	FLORIDA
21	28	37	14	262	257	258	254	GEORGIA
0	21	37	42	0	230	231	231	GUAM
21	12	32	36	250	258	251	251	HAWAII
19	22	36	23	280	270	271	269	IDAHO
16	23	31	30	263	262	260	259	ILLINOIS
9	27	36	28	268	267	268	267	INDIANA
16	20	34	30	280	282	276	277	IOWA
12	12	24	51	250	260	259	256	KENTUCKY
16	21	31	31	242	245	247	245	LOUISIANA
22	21	40	17	260	260	261	263	MARYLAND
22	17	30	31	263	263	264	265	MICHIGAN
31	18	29	22	276	277	279	272	MINNESOTA
31	19	31	18	282	280	280	281	MONTANA
9	15	45	31	280	274	276	276	NEBRASKA
19	20	32	29	276	274	274	269	NEW HAMPSHIRE
17	16	36	31	274	267	271	267	NEW JERSEY
18	24	29	28	260	255	256	257	NEW MEXICO
21	24	31	24	261	266	261	252	NEW YORK
31	23	28	18	252	254	248	249	NORTH CAROLINA
26	12	38	25	285	284	282	278	NORTH DAKOTA
21	20	31	28	262	264	263	269	OHIO
17	18	34	31	263	266	263	262	OKLAHOMA
41	24	22	13	272	271	271	267	OREGON
21	15	34	30	266	270	266	266	PENNSYLVANIA
17	14	33	36	274	256	251	263	RHODE ISLAND
24	19	26	31	255	254	254	258	TEXAS
14	14	18	54	210	218	216	220	VIRGIN ISLANDS
18	17	29	37	265	264	265	261	VIRGINIA
19	25	40	16	253	255	258	257	WEST VIRGINIA
23	20	37	20	273	277	274	278	WISCONSIN
17	15	39	29	276	276	273	268	WYOMING
27	**16**	**29**	**28**	**267**	**265**	**262**	**260**	**NATION**

Table 6

Percent of Students by State Having Teachers Who Have Spent 16 or More Hours, 1–15 Hours, or No Hours in Inservice Education in Mathematics or the Teaching of Mathematics in the Past Year

Table 7

Percent of Students and Their Mathematics Proficiencies by State Who Are Permitted Unrestricted Use of Calculators in Mathematics Class and Permitted to Use Calculators on Mathematics Tests

Table 8

Percent of Students Grouped for Instruction and Their Mathematics Proficiency Scores by State

	16 or More Hours (%)	1-15 Hours (%)	No Hours (%)	Students With Unrest. Use (%)	Unrest. Use Proficiency (%)	Percent Use on Tests	Test Use Proficiency	Grouped (%)
ALABAMA	27	57	15	7	268	21	257	60
ARIZONA	23	50	27	17	261	22	264	71
ARKANSAS	46	45	8	9	261	13	265	50
CALIFORNIA	43	47	10	31	268	50	263	72
COLORADO	37	49	14	30	276	45	273	66
CONNECTICUT	39	52	8	26	284	43	279	86
DELAWARE	42	45	13	23	274	33	265	82
DISTRICT OF COLUMBIA	53	41	5	38	239	49	235	51
FLORIDA	44	42	14	12	273	23	267	77
GEORGIA	35	48	17	14	268	30	268	79
GUAM	27	35	39	30	240	9	233	93
HAWAII	28	45	27	14	262	15	272	70
IDAHO	36	45	19	28	278	30	275	64
ILLINOIS	24	58	18	23	270	36	271	69
INDIANA	16	57	26	8	285	15	273	52
IOWA	26	58	16	20	286	42	280	61
KENTUCKY	18	53	29	12	266	20	261	52
LOUISIANA	37	49	14	5	261	16	253	93
MARYLAND	47	47	6	19	278	30	274	64
MICHIGAN	26	50	24	26	280	37	273	63
MINNESOTA	34	55	11	31	284	47	280	46
MONTANA	38	58	5	32	287	57	283	49
NEBRASKA	37	48	15	21	284	36	279	78
NEW HAMPSHIRE	69	28	3	21	281	38	277	78
NEW JERSEY	29	56	14	11	288	14	287	65
NEW MEXICO	19	45	36	18	264	20	259	73
NEW YORK	23	59	18	5	251	12	255	80
NORTH CAROLINA	51	39	10	10	261	18	262	30
NORTH DAKOTA	25	55	20	24	283	39	279	68
OHIO	22	63	16	15	272	33	269	56
OKLAHOMA	26	63	18	10	275	15	272	90
OREGON	48	56	10	36	284	53	277	81
PENNSYLVANIA	27	54	19	13	281	20	280	69
RHODE ISLAND	22	54	24	19	263	23	268	63
TEXAS	38	49	13	12	270	22	268	80
VIRGIN ISLANDS	26	49	25	1	*	3	*	60
VIRGINIA	31	56	13	14	280	27	277	52
WEST VIRGINIA	22	57	21	11	280	20	287	66
WISCONSIN	2	55	13	29	286	50	279	87
WYOMING	26	45	20	36	279	49	274	45
NATION	**39**	**51**	**11**	**18**	**281**	**33**	**271**	**63**

Tables 6, 7, 8, 9, and 10 Source: U.S. Department of Education, National Center for Education Statistics, "The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States," June 6, 1991. Council of Chief State School Officers, State Education Assessment Center, Washington, D.C., Fall 1992.

* Sample size insufficient to permit reliable estimate.

Table 9

Overall Mathematics Proficiency Score and State Expenditure Per Pupil in Fiscal Year 1990 Listed by State

Math Proficiency of Grouped Students	Mathematics Proficiency	State Expenditure Per Pupil in Fiscal 1990
256	252	3144
263	259	3721
262	256	3229
262	256	4502
272	267	4357
273	270	7241
265	261	5232
236	231	7827
259	255	4597
260	258	3918
263	• •	• •
273	251	4130
286	272	2921
272	260	4521
278	267	4217
259	278	4190
253	256	3321
263	246	3579
270	260	5502
278	264	4698
283	276	4698
275	280	4290
274	276	4553
276	273	4786
262	269	7408
265	256	3449
253	261	7051
267	250	3968
269	281	3899
267	264	4574
273	263	3297
271	271	4906
263	266	5583
256	258	5798
266	218	3835
261	• •	• •
262	264	4630
273	256	4018
232	274	5020
228	272	5239
269	**261**	**4622**

• • Numbers not available

Table 10

Teacher's Reports That They Get Some or None of the Materials and Resources They Need to Teach by Percent of Students

Percent of Students	Profic. of Students Who Get Some or No Resources	
72	229	GUAM
66	216	VIRGIN ISLANDS
58	226	DISTRICT OF COLUMBIA
58	243	LOUISIANA
45	253	WEST VIRGINIA
44	249	HAWAII
41	253	ARKANSAS
40	271	IDAHO
39	256	NEW MEXICO
38	243	NORTH CAROLINA
36	256	GEORGIA
35	282	NORTH DAKOTA
35	248	NEW YORK
34	269	OHIO
34	253	CALIFORNIA
33	257	MICHIGAN
33	261	OKLAHOMA
32	269	DELAWARE
32	254	RHODE ISLAND
32	252	FLORIDA
31	253	VIRGINIA
31	248	ALABAMA
31	257	ARIZONA
31	256	KENTUCKY
29	249	TEXAS
29	266	INDIANA
29	259	PENNSYLVANIA
28	248	ILLINOIS
24	270	OREGON
23	267	WISCONSIN
23	263	COLORADO
23	268	NEW HAMPSHIRE
23	266	CONNECTICUT
23	273	MINNESOTA
22	269	NEBRASKA
22	260	NEW JERSEY
21	245	MARYLAND
21	280	MONTANA
16	272	WYOMING
14	278	IOWA
31	**261**	**NATION**

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State Profiles

ALABAMA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	259
■ Measurement	247
■ Geometry	248
■ Data Analysis, Statistics and Probability	251
■ Algebra and Functions	251
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	82
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	80

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	721,806
Gross State Product *(in Millions)* /Gross State Product Per School Age Child *(1990)*	67,886/ 87,539
[1] Expenditure Per Pupil *(1990)*	$3,144
Per Capita Income *(1990)*	$11,486
Percent of Children in Poverty *(1990)*	24.0
Percent of Adults with Four Years High School *(1990)*	67.3
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	48.9

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	66/25
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	9/27/36
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	41
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	34
Percent of High School Students Taking Key Math Courses *(1990)*.	
■ Algebra I	70
■ Algebra II	46
■ Calculus	6
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,8 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is ALABAMA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	57
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	20
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	34
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[3] *This does not include competency, proficiency, or end-of-course tests.*

Alaska

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	85
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	90

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	113,874
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	19,582/ 166,731
[1] Expenditure Per Pupil *(1990)*	$7,526
Per Capita Income *(1990)*	$17,610
Percent of Children in Poverty *(1990)*	10.9
Percent of Adults with Four Years High School *(1990)*	87.0
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	36.6

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,6,8 ITBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is ALASKA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with Distnct or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education

ARIZONA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	264
■ Measurement	257
■ Geometry	256
■ Data Analysis, Statistics and Probability	258
■ Algebra and Function	258
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	80
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	81

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	639,853
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	65,306/ 94,679
[1] Expenditure Per Pupil *(1990)*	$3,721
Per Capita Income *(1990)*	$13,461
Percent of Children in Poverty *(1990)*	21.7
Percent of Adults with Four Years High School *(1990)*	81.0
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	51.5

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	15/6
Teacher Assessment for Certification *(1990)*	BS PS
Credits in Math Required for Elementary/Middle/ Secondary TeacherCertification in Math *(1992)*	6/NSR/ 30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operationsand Measurement *(1990)*	31
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	33
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	2-12 ITBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is ARIZONA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	50
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	17
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	33
State Releases a Public Report with Distnct or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

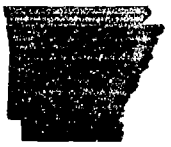
[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement.

Arkansas



OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	262
■ Measurement	253
■ Geometry	253
■ Data Analysis, Statistics and Probability	254
■ Algebra and Functions	253
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	83
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	82

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	436,286
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	37,169/ 81,428
[1]Expenditure Per Pupil *(1990)*	$3,229
Per Capita Income *(1990)*	$10,520
Percent of Children in Poverty *(1990)*	25.0
Percent of Adults with Four Years High School *(1990)*	71.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	43.6

POLICIES AND PRACTICES IN MATHEMATICS

[2]Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	51/27
Teacher Assessment for Certification *(1990)*	PSCK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/18/21
[2]Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	39
[2]Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	25
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	88
■ Algebra II	48
■ Calculus	5
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	5 [4]
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3]Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,7,10 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is ARKANSAS in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	45
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	19
[2]Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	25
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

[4] Graduation requirements include five credits combined for math and science.

CALIFORNIA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	259
■ Measurement	252
■ Geometry	255
■ Data Analysis, Statistics and Probability	254
■ Algebra and Functions	256
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	77
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	77

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	4,950,474
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	697,381/ 130,278
[1] Expenditure Per Pupil *(1990)*	$4,502
Per Capita Income *(1990)*	$16,409
Percent of Children in Poverty *(1990)*	17.8
Percent of Adults with Four Years High School *(1990)*	77.8
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	[4]

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	22/12
Teacher Assessment for Certification *(1990)*	BS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	31
[3] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	36
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	92
■ Algebra II	44
■ Calculus	9
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[5] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,8,12 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is CALIFORNIA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	47
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	14
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	36
State Releases a Public Report with Distinct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

[4] Mother's education not required on birth certificate.

[5] IHE-Course credits are established by a state-approved program of higher education.

C O L O R A D O

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	269
■ Measurement	265
■ Geometry	266
■ Data Analysis, Statistics and Probability	269
■ Algebra and Functions	266
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	87
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	574,213
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	68,180/ 112,069
[1] Expenditure Per Pupil *(1990)*	$4,357
Per Capita Income *(1990)*	$14,821
Percent of Children in Poverty *(1990)*	15.0
Percent of Adults with Four Years High School *(1990)*	87.0
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	46.0

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	57/20
Teacher Assessment for Certification *(1990)*	BS IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	22
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	36
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	*
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,7,10 ITBS/TAP

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is COLORADO in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	49
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	15
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	36
State Releases a Public Report with Distnct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement

IHE-Course credits are established by state-approved program of higher education

** Graduation requirements are established by the local school board.*

Connecticut

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	273
■ Measurement	269
■ Geometry	266
■ Data Analysis, Statistics and Probability	272
■ Algebra and Functions	268
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	88
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	89

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	469,123
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	88,863/ 168,373
[1] Expenditure Per Pupil *(1990)*	$7,241
Per Capita Income *(1990)*	$20,189
Percent of Children in Poverty *(1990)*	10.4
Percent of Adults with Four Years High School *(1990)*	84.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	48.3

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	33/19
Teacher Assessment for Certification *(1990)*	BS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	3/NSR/ 18
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	35
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	38
Percent of High School Students Taking Key Math Courses *(1990)*[3]	
■ Algebra I	74
■ Algebra II	61
■ Calculus	14
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,6,8 Conn. Test

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is CONNECTICUT in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	52
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	25
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	38
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement.

DELAWARE

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	265
■ Measurement	258
■ Geometry	256
■ Data Analysis, Statistics and Probability	261
■ Algebra and Functions	260
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	88
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	99,658
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	15,418/ 134,635
[1] Expenditure Per Pupil *(1990)*	$5,232
Per Capita Income *(1990)*	$15,854
Percent of Children in Poverty *(1990)*	11.7
Percent of Adults with Four Years High School *(1990)*	79.0
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	42.7

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	39/24
Teacher Assessment for Certification (1990)	BS
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/15/30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	32
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	28
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	73
■ Algebra II	43
■ Calculus	17
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,8,11 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is DELAWARE in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	45
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	7
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	28
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[3] *This does not include competency, proficiency, or end-of-course tests.*

District of Columbia

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	238
■ Measurement	221
■ Geometry	229
■ Data Analysis, Statistics and Probability	222
■ Algebra and Functions	235
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	83
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	84

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	80,694
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	39,363/ 493,636
[1] Expenditure Per Pupil *(1990)*	$7,827
Per Capita Income *(1990)*	$18,881
Percent of Children in Poverty *(1990)*	25.0
Percent of Adults with Four Years High School *(1990)*	73.3
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	44.2

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	64/36
Teacher Assessment for Certification *(1990)*	BS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	9/24/27
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	36
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	36
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	65
■ Algebra II	39
■ Calculus	3
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State s Large Scale Math Assessment Program *(1991)*	3,6,8, 9,11 CTBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is the DISTRICT OF COLUMBIA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	41
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	4
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	36
State Releases a Public Report with Distinct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

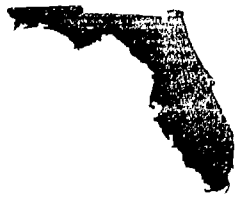
Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment

[3] This does not include competency, proficiency, or end-of-course tests

Florida



OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	260
■ Measurement	251
■ Geometry	251
■ Data Analysis, Statistics and Probability	255
■ Algebra and Functions	255
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	79
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	82

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,861,592
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	226,964/ 112,546
[1] Expenditure Per Pupil *(1990)*	$4,597
Per Capita Income *(1990)*	$14,698
Percent of Children in Poverty *(1990)*	18.3
Percent of Adults with Four Years High School *(1990)*	79.7
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	53.4

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	32/14
Teacher Assessment for Certification *(1990)*	PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/ 21/30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	38
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	30
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	78
■ Algebra II	42
■ Calculus	9
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,7,10 State/ District, Optional

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is FLORIDA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	42
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	15
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	30
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement

GEORGIA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	263
■ Measurement	252
■ Geometry	256
■ Data Analysis, Statistics and Probability	260
■ Algebra and Functions	257
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	80
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	80

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,151,687
Gross State Product *(in Millions)* /Gross State Product Per School Age Child *(1990)*	129,776/ 74,938
[1] Expenditure Per Pupil *(1990)*	$3,918
Per Capita Income *(1990)*	$13,631
Percent of Children in Poverty *(1990)*	19.8
Percent of Adults with Four Years High School *(1990)*	73.9
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	50.4

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	34/16
Teacher Assessment for Certification *(1990)*	OK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	[4] NSR/[4]
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	45
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	39
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	2,4,7,9 ITBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is GEORGIA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	48
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	12
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	39
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[3] *This does not include competency, proficiency, or end-of-course tests.*

[4] *Georgia requires 10 quarters for elementary and 60 quarters for secondary certification.*

NSR-No state requirement.

HAWAII

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	256
■ Measurement	249
■ Geometry	252
■ Data Analysis, Statistics and Probability	242
■ Algebra and Functions	249
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	91
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	93

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	171,708
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*[1]	25,755/ 130,800
[1] Expenditure Per Pupil *(1990)*	$4,130
Per Capita Income *(1990)*	$15,770
Percent of Children in Poverty *(1990)*	11.1
Percent of Adults with Four Years High School *(1990)*	85.7
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	26.5

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	53 / 58
Teacher Assessment for Certification *(1990)*	BS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/NSR/ IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	31
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	23
Percent of High School Students Taking Key Math Courses *(1990)*.	
■ Algebra I	52
■ Algebra II	33
■ Calculus	4
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	2,4,7,9 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is HAWAII in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	45
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	5
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	23
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

NSR-No state requirement.

IDAHO

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	274
■ Measurement	270
■ Geometry	269
■ Data Analysis, Statistics and Probability	274
■ Algebra and Function	269
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	86

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	220,840
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	16,339/ 71,577
Expenditure Per Pupil *(1990)*	$2,921
Per Capita Income *(1990)*	$11,457
Percent of Children in Poverty *(1990)*	15.8
Percent of Adults with Four Years High School *(1990)*	78.7
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	43.7

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	34/10
Teacher Assessment for Certification *(1990)*	CK PS
Credits in Math Required for Elementary/Middle/ Secondary TeacherCertification in Math *(1992)*	6/NSR/ 20
Percent of Teachers Placing Heavy Emphasis on Numbers,Operationsand Measurement *(1990)*	29
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	35
Percent of High School Students Taking Key Math Courses *(1990)*.	
■ Algebra I	95
■ Algebra II	64
■ Calculus	6
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	6,8 ITBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is IDAHO in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	45
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	8
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	35
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency or end-of-course tests.

NSR-No state requirement

Illinois

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	265
■ Measurement	256
■ Geometry	256
■ Data Analysis, Statistics and Probability	262
■ Algebra and Functions	250
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	86

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,821,407
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	256,478/ 122,236
[1] Expenditure Per Pupil *(1990)*	$4,521
Per Capita Income *(1990)*	$15,201
Percent of Children in Poverty *(1990)*	16.8
Percent of Adults with Four Years High School *(1990)*	80.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	45.2

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	30/15
Teacher Assessment for Certification *(1990)*	BS PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/NSR/ 25
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	29
[3] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	42
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	77
■ Algebra II	39
■ Calculus	9
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[4] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,8,10 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is ILLINOIS in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	58
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	18
[3] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	42
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for elementary and secondary schools in fiscal year 1990.*

[3] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[4] *This does not include competency, proficiency, or end-of-course tests*

[2] *Graduation requirements include five credits combined for math and science*

NSR-No state requirement

INDIANA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	271
■ Measurement	263
■ Geometry	264
■ Data Analysis, Statistics and Probability	269
■ Algebra and Functions	265
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	86

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	954,581
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	105,314/ 99,606
Expenditure Per Pupil *(1990)*	$4,217
Per Capita Income *(1990)*	$13,149
Percent of Children in Poverty *(1990)*	15.8
Percent of Adults with Four Years High School *(1990)*	76.9
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	45.5

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	64/34
Teacher Assessment for Certification *(1990)*	BS PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/18/36
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	32
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	30
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	60
■ Algebra II	45
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	N/A

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is INDIANA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	57
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	17
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	30
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

IOWA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	283
■ Measurement	277
■ Geometry	275
■ Data Analysis, Statistics and Probability	281
■ Algebra and Functions	274
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	93
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	92

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	483,652
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	52,574/ 100,012
[1] Expenditure Per Pupil *(1990)*	$4,190
Per Capita Income *(1990)*	$12,422
Percent of Children in Poverty *(1990)*	14.0
Percent of Adults with Four Years High School *(1990)*	81.3
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	35.6

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	51/18
Teacher Assessment for Certification *(1990)*	BS PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/ NSR/24
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	31
[3] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	37
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	72
■ Algebra II	50
■ Calculus	9
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	[4]
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[5] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	N/A

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is IOWA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	58
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	25
[3] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	37
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[3] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[5] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement.

[4] The local board determines the graduation requirements.

Kansas

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	89
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	89

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	437,034
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	48,829/ 103,184
Expenditure Per Pupil *(1990)*	$4,290
Per Capita Income *(1990)*	$13,300
Percent of Children in Poverty *(1990)*	13.9
Percent of Adults with Four Years High School *(1990)*	86.8
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	42.3

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	BS PS
Credits in Math Required for Elementary, Middle/ Secondary Teacher Certification in Math *(1992)*	NSR IHE IHE
Percent of Teachers Placing Heavy Emphasis on Numbers Operations and Measurement *(1990)*	N/A
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	[illegible]
■ Algebra II	17
■ Calculus	9
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,7,10 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is KANSAS in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by state-approved pr[illegible] of higher [illegible]

NSR-No state requirement

Kentucky

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	261
■ Measurement	253
■ Geometry	253
■ Data Analysis, Statistics and Probability	257
■ Algebra and Functions	256
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	82
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	81

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	636,401
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	65,858/ 93,652
[1] Expenditure Per Pupil *(1990)*	$3,321
Per Capita Income *(1990)*	$11,153
Percent of Children in Poverty *(1990)*	24.5
Percent of Adults with Four Years High School *(1990)*	67.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	47.5

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	31/11
Teacher Assessment for Certification (1990)	BS PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/24/ 30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	39
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	36
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	81
■ Algebra II	54
■ Calculus	6
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,8,12 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is KENTUCKY in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	53
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	16
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	36
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement.

LOUISIANA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:

■ Numbers and Operations	253
■ Measurement	241
■ Geometry	242
■ Data Analysis, Statistics and Probability	243
■ Algebra and Functions	245
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	81
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	79

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	784,757
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	79 138/ 88,658
Expenditure Per Pupil *(1990)*	$3,579
Per Capita Income *(1990)*	$10,635
Percent of Children in Poverty *(1990)*	31 2
Percent of Adults with Four Years High School *(1990)*	71.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	45.8

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	26/9
Teacher Assessment for Certification *(1990)*	BS PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/12/20
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	35
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	37
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	45
■ Algebra II	24
■ Calculus	4
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State s Large Scale Math Assessment Program *(1991)*	3,5,7 CRT

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is LOUISIANA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	49
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	8
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	37
State Releases a Public Report with Distinct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of course tests.

Maine

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	90
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	89

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	215,149
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	23,474/ 85,897
[1] Expenditure Per Pupil *(1990)*	$4,903
Per Capita Income *(1990)*	$12,957
Percent of Children in Poverty *(1990)*	13.2
Percent of Adults with Four Years High School *(1990)*	81.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	44.9

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	BS PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/ [3]/36
[4] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
[4] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	8.4
■ Algebra II	6.4
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[5] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,8,11 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MAINE in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[4] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency or end-of-course tests.

[4] Instead of credits, two minors are required.

Maryland

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	264
■ Measurement	256
■ Geometry	256
■ Data Analysis, Statistics and Probability	260
■ Algebra and Functions	263
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	87

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	715,176
Gross State Product *(in Millions)* /Gross State Product Per School Age Child *(1990)*	99,074/ 109,544
Expenditure Per Pupil *(1990)*	$5,502
Per Capita Income *(1990)*	$17,730
Percent of Children in Poverty *(1990)*	10.9
Percent of Adults with Four Years High School *(1990)*	78.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	40.9

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	47/19
Teacher Assessment for Certification *(1990)*	BS PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/NSR/ 30
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	28
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	37
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	34
■ Algebra II	51
■ Calculus	13
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State Large Scale Math Assessment Program *(1991)*	3,5,8 CTBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MARYLAND in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	47
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	18
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	37
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment

This does not include competency, proficiency, or end-of course tests

NSR-No state requirement.

Massachusetts

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	90
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	89

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	834,314
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	144,791/ 153,934
[1] Expenditure Per Pupil *(1990)*	$5,766
Per Capita Income *(1990)*	$17,224
Percent of Children in Poverty *(1990)*	12.9
Percent of Adults with Four Years High School *(1990)*	83.7
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	50.9

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/36/ 36
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
[3] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	[4]
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	N/A
[5] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,8,12 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MASSACHUSETTS in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with Distnct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[3] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[5] *This does not include competency, proficiency, or end-of-course tests.*

[4] *Graduation requirements are established by the local school boards*

NSR-No state requirement

MICHIGAN

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	268
■ Measurement	260
■ Geometry	262
■ Data Analysis, Statistics and Probability	264
■ Algebra and Function	264
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,581,925
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	181,827/ 103,534
Expenditure Per Pupil *(1990)*	$5,090
Per Capita Income *(1990)*	$14,154
Percent of Children in Poverty *(1990)*	18.2
Percent of Adults with Four Years High School *(1990)*	79.8
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	46.9

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	47/23
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/30/ 30
Percent of Teachers Placing Heavy Emphasis on Numbers Operationsand Measurement *(1990)*	28
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	34
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	N.A
■ Algebra II	N.A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	*
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
Grades and Source of Test Included in State s Large Scale Math Assessment Program *(1991)*	4,7,10 State/ NAEP

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MICHIGAN in implementing the following initiatives?	
Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	50
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	12
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	34
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

** Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

† During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

‡ This does not include competency, proficiency, or end-of course tests.

** Graduation requirements are established by the local school board.*

MINNESOTA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	279
■ Measurement	272
■ Geometry	273
■ Data Analysis, Statistics and Probability	279
■ Algebra and Functions	274
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	92
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	93

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	756,374
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	93,559/ 112,724
[1] Expenditure Per Pupil *(1990)*	$4,698
Per Capita Income *(1990)*	$14,389
Percent of Children in Poverty *(1990)*	12.4
Percent of Adults with Four Years High School *(1990)*	87.3
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	37.5

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	88/40
Teacher Assessment for Certification *(1990)*	BS
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	24
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	35
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	90
■ Algebra II	55
■ Calculus	12
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	1
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	5,8,11 State and District

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MINNESOTA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	55
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	12
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	35
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

Mississippi

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	83
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	80

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	502,417
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	38,135/ 69,161
Expenditure Per Pupil *(1990)*	$2,936
Per Capita Income *(1990)*	$9,648
Percent of Children in Poverty *(1990)*	33.5
Percent of Adults with Four Years High School *(1990)*	68.9
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	44.5

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	PSCKIO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/NSR/ IHE
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	85
■ Algebra II	58
■ Calculus	3
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,6,8 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MISSISSIPPI in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

NSR-No state requirement.

Missouri

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	85
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	86

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	812,234
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	100,081/ 105,841
[1] Expenditure Per Pupil *(1990)*	$4,071
Per Capita Income *(1990)*	$12,989
Percent of Children in Poverty *(1990)*	17.4
Percent of Adults with Four Years High School *(1990)*	80.9
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	45.4

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	5/21/30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*[3]	
■ Algebra I	95
■ Algebra II	58
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[4] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,8,10 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MISSOURI in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

MONTANA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	282
■ Measurement	279
■ Geometry	280
■ Data Analysis, Statistics and Probability	282
■ Algebra and Functions	278
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	89
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	89

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	152,974
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	13,104/ 80,716
[1] Expenditure Per Pupil *(1990)*	$4,240
Per Capita Income *(1990)*	$11,213
Percent of Children in Poverty *(1990)*	19.9
Percent of Adults with Four Years High School *(1990)*	84.6
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	44.7

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	50/19
Teacher Assessment for Certification *(1990)*	BS PS
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	9*/NSR/ 30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	25
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	45
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	94
■ Algebra II	65
■ Calculus	6
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,8,11 State Distnct optional

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is MONTANA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	58
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	17
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	45
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement.

**Quarters, not credits.*

Nebraska

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	279
■ Measurement	274
■ Geometry	273
■ Data Analysis, Statistics and Probability	279
■ Algebra and Functions	273
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	92
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	92

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	274,081
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	31,115/ 100,564
[1] Expenditure Per Pupil *(1990)*	$4,553
Per Capita Income *(1990)*	$12,452
Percent of Children in Poverty *(1990)*	13.5
Percent of Adults with Four Years High School *(1990)*	85.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	32.2

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	71/30
Teacher Assessment for Certification (1990)	BS
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/15/ 30
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	27
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	35
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	75
■ Algebra II	54
■ Calculus	6
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	*
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[4] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3 levels Distnct Optional

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NEBRASKA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	48
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	20
[5] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	35
State Releases a Public Report with Distnct or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[3] *This does not include competency, proficiency, or end-of-course tests.*

[4] *IHE Course credits are established by a state-approved program of higher education.*

Graduation requirements are established by the local school board.

NEVADA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment.	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	78
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	80

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	201,316
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	27,960/ 136,569
[1] Expenditure Per Pupil *(1990)*	$3,816
Per Capita Income *(1990)*	$15,214
Percent of Children in Poverty *(1990)*	12.8
Percent of Adults with Four Years High School *(1990)*	83.9
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	45.6

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	BS PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/ NSR/30
[2] Percent of Teachers Placing Heavy Emphasis on Numbers, Operations and Measurement *(1990)*	N/A
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	30
■ Algebra II	32
■ Calculus	5
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,9, CTBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NEVADA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with Distrct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests

NSR-No state requirement

New Hampshire

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	275
■ Measurement	272
■ Geometry	272
■ Data Analysis, Statistics and Probability	276
■ Algebra and Functions	271
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	87
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	172,785
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	24,504/ 126,186
Expenditure Per Pupil *(1990)*	$4,786
Per Capita Income *(1990)*	$15,959
Percent of Children in Poverty *(1990)*	07.0
Percent of Adults with Four Years High School *(1990)*	85.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	51.9

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	44/20
Teacher Assessment for Certification *(1990)*	BS
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	26
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	37
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	N A
■ Algebra II	N A
■ Calculus	N A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	N/A
Grades and Source of Test Included in State's Scale Math Assessment Program *(1991)*	3 ('93) State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NEW HAMPSHIRE in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	28
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	15
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	37
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

NEW JERSEY

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	274
■ Measurement	267
■ Geometry	266
■ Data Analysis, Statistics and Probability	270
■ Algebra and Functions	268
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,089,646
Gross State Product *(in Millions)* /Gross State Product Per School Age Child *(1990)*	203,375/ 160,539
Expenditure Per Pupil *(1990)*	$7,408
Per Capita Income *(1990)*	$18,714
Percent of Children in Poverty *(1990)*	11.0
Percent of Adults with Four Years High School *(1990)*	81.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	43.6

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	41/17
Teacher Assessment for Certification *(1990)*	CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	NSR/ NSR/30
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	37
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	46
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,8,9 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NEW JERSEY in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	56
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	22
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	46
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment

This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement

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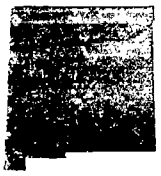
New Mexico



OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	258
■ Measurement	253
■ Geometry	257
■ Data Analysis, Statistics and Probability	253
■ Algebra and Functions	256
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	82
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	82

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	301,881
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	25,414/ 79,205
Expenditure Per Pupil *(1990)*	$3,449
Per Capita Income *(1990)*	$11,246
Percent of Children in Poverty *(1990)*	27.5
Percent of Adults with Four Years High School *(1990)*	77.5
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	45.1

POLICIES AND PRACTICES IN MATHEMATICS

[1] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	34/15
Teacher Assessment for Certification *(1990)*	BS PS IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/NSR/ 24
[1] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	35
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	39
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	55
■ Algebra II	37
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,5,8 CTBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objectives of education. How far along is NEW MEXICO in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	45
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	11
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	39
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

NSR-No state requirement

New York

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment.	
■ Numbers and Operations	263
■ Measurement	255
■ Geometry	259
■ Data Analysis, Statistics and Probability	263
■ Algebra and Function	260
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	85

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	2,598,337
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	441,068/ 146,837
Expenditure Per Pupil *(1990)*	$7,051
Per Capita Income *(1990)*	$16,501
Percent of Children in Poverty *(1990)*	18.8
Percent of Adults with Four Years High School *(1990)*	78.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	*

POLICIES AND PRACTICES IN MATHEMATICS

[1]Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	48/30
Teacher Assessment for Certification *(1990)*	BS PS
Credits in Math Required for Elementary/Middle/ Secondary TeacherCertification in Math *(1992)*	NSR/18[3] 24
[2]Percent of Teachers Placing Heavy Emphasis on Numbers/Operationsand Measurement *(1990)*	29
[2]Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	45
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	69
■ Algebra II	4[4]
■ Calculus	12
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[2]Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NEW YORK in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	59
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	20
[2]Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	45
State Releases a Public Report with Distrct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment*

[3] *This does not include competency, proficiency, or end-of course tests*

[4] *New York's figures are for New York City only, hence they were not included*

NSR-No state requirement

NORTH CAROLINA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	255
■ Measurement	241
■ Geometry	249
■ Data Analysis, Statistics and Probability	247
■ Algebra and Functions	251
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	85
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	85

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,086,871
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	130,085/ 113,394
[1]Expenditure Per Pupil *(1990)*	$3,968
Per Capita Income *(1990)*	$12,885
Percent of Children in Poverty *(1990)*	16.9
Percent of Adults with Four Years High School *(1990)*	71.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	48.7

POLICIES AND PRACTICES IN MATHEMATICS

[2]Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	34/14
Teacher Assessment for Certification *(1990)*	PSCKIO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE
[2]Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	33
[2]Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	31
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	67
■ Algebra II	51
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3]Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,8 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NORTH CAROLINA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	39
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	19
[2]Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	31
State Releases a Public Report with Distnct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

North Dakota

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment[1]	
■ Numbers and Operations	286
■ Measurement	280
■ Geometry	278
■ Data Analysis, Statistics and Probability	286
■ Algebra and Functions	275
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	95
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	94

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	117,825
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	11,231/ 88,059
[1] Expenditure Per Pupil *(1990)*	$3,899
Per Capita Income *(1990)*	$11,051
Percent of Children in Poverty *(1990)*	16.9
Percent of Adults with Four Years High School *(1990)*	80.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	31.2

POLICIES AND PRACTICES IN MATHEMATICS

[1] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	61/15
Teacher Assessment for Certification *(1990)*	No state Policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	3/IHE/IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	31
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	40
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	35
■ Algebra II	64
■ Calculus	3
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,8,11 CTBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is NORTH DAKOTA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	55
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	18
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	40
State Releases a Public Report with Distinct or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment

[3] This does not include competency, proficiency, or end-of-course tests

IHE-Course credits are established by a state-approved program of higher education

OHIO

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	268
■ Measurement	259
■ Geometry	260
■ Data Analysis, Statistics and Probability	266
■ Algebra and Functions	262
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	87
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	87

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,771,516
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	211 545/ 105,006
Expenditure Per Pupil *(1990)*	$4,574
Per Capita Income *(1990)*	$13,461
Percent of Children in Poverty *(1990)*	17 6
Percent of Adults with Four Years High School *(1990)*	79.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	42.6

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	39/12
Teacher Assessment for Certification *(1990)*	CK PS
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE-20/ 30
Percent of Teachers Placing Heavy Emphasis on Numbers, Operations and Measurement *(1990)*	33
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	37
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	80
■ Algebra II	47
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,6,8,10 State Distnct/ optional

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is OHIO in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	63
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	12
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	37
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

OKLAHOMA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	268
■ Measurement	258
■ Geometry	259
■ Data Analysis, Statistics and Probability	264
■ Algebra and Functions	262
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	85

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	579,087
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	52,342/ 85,739
· Expenditure Per Pupil *(1990)*	$3,297
Per Capita Income *(1990)*	$11,893
Percent of Children in Poverty *(1990)*	21.4
Percent of Adults with Four Years High School *(1990)*	77.7
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	44.6

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	35/16
Teacher Assessment for Certification *(1990)*	IO BK CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	2/18/40
Percent of Teachers Placing Heavy Emphasis on Numbers, Operations and Measurement *(1990)*	35
· Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	36
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	35
■ Algebra II	60
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
· Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,5,7,9, 11 ITBS / TAP

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is OKLAHOMA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	63
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive a Lot of the Materials and Resources They Need for Effective Teaching)*	12
· Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	36
State Releases a Public Report with Distinct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

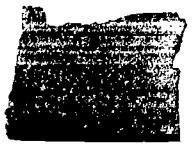
Notes:

· Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

· During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

· This does not include competency, proficiency or end-of course tests.

OREGON



OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	273
■ Measurement	269
■ Geometry	270
■ Data Analysis, Statistics and Probability	274
■ Algebra and Functions	270
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	83
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	84

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	484,652
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	52,116/ 99,704
Expenditure Per Pupil *(1990)*	$4,906
Per Capita Income *(1990)*	$13,418
Percent of Children in Poverty *(1990)*	15.2
Percent of Adults with Four Years High School *(1990)*	86.0
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	49.5

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	34/27
Teacher Assessment for Certification (1990)	BS PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	12/NSR/ 21-42
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	24
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	31
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,5,8,11 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is OREGON in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	56
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	24
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	31
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

P E N N S Y L V A N I A

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	270
■ Measurement	265
■ Geometry	263
■ Data Analysis, Statistics and Probability	268
■ Algebra and Functions	265
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	89
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	1,667,834
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	227,896/ 114,076
[1] Expenditure Per Pupil *(1990)*	$5,583
Per Capita Income *(1990)*	$14,068
Percent of Children in Poverty *(1990)*	15.4
Percent of Adults with Four Years High School *(1990)*	79.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	40.0

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	69/33
Teacher Assessment for Certification *(1990)*	BS PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/NSR/ IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	31
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	33
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	88
■ Algebra II	57
■ Calculus	16
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	5,8 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is PENNSYLVANIA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	54
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	19
[3] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	33
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests

IHE-Course credits are established by a state-approved program of higher education

NSR-No state requirement.

Rhode Island

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	264
■ Measurement	256
■ Geometry	256
■ Data Analysis, Statistics and Probability	258
■ Algebra and Functions	261
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	87
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	85

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	138,813
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	18,807/ 118,491
[1] Expenditure Per Pupil *(1990)*	$5,798
Per Capita Income *(1990)*	$14,981
Percent of Children in Poverty *(1990)*	13.5
Percent of Adults with Four Years High School *(1990)*	76.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	56.9

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	55/32
Teacher Assessment for Certification *(1990)*	BS PS IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/18/ IHE
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	33
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	30
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[4] Grades and Source of Test Included in State's Scale Math Assessment Program *(1991)*	3,6,8,10 MAT

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is RHODE ISLAND in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	54
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	14
[5] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	30
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990*

[3] *During the 1990 NAEP Mathematics Trial State Assessment public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[4] *This does not include competency, proficiency, or end-of-course tests*

IHE-Course credits are established by a state-approved program of higher education

SOUTH CAROLINA

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:

■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	84
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	83

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	622,112
Gross State Product *(in Millions)* /Gross State Product Per School Age Child *(1990)*	60,150/ 90,605
[1] Expenditure Per Pupil *(1990)*	$3,775
Per Capita Income *(1990)*	$11,897
Percent of Children in Poverty *(1990)*	20.8
Percent of Adults with Four Years High School *(1990)*	70.2
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	47.4

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	PS CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE
· Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
· Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	69
■ Algebra II	55
■ Calculus	7
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,5,7, 9, 11 Stanford-8

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is SOUTH CAROLINA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[3] *This does not include competency, proficiency, or end-of-course tests*

IHE-Course credits are established by a state-approved program of higher education

South Dakota

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	91
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	91

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	129,164
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	11,135/ 77,349
Expenditure Per Pupil *(1990)*	$3,512
Per Capita Income *(1990)*	$10,661
Percent of Children in Poverty *(1990)*	20.1
Percent of Adults with Four Years High School *(1990)*	80.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	36.9

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6,12/18
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,6,11 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is SOUTH DAKOTA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with Distnct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency or end-of-course tests.

TENNESSEE

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Function	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	81
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	81

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	824,595
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	92,267/ 104,470
[1] Expenditure Per Pupil *(1990)*	$3,405
Per Capita Income *(1990)*	$12,255
Percent of Children in Poverty *(1990)*	20.7
Percent of Adults with Four Years High School *(1990)*	67.4
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	49.9

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	NO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	[4]
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	.3
■ Algebra II	.24
■ Calculus	.1
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	2-8,10 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is TENNESSEE in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests.

[4] Tennessee requires 9 quarters for elementary, 0 for middle and 36 for secondary certification.

Texas

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	262
■ Measurement	253
■ Geometry	258
■ Data Analysis, Statistics and Probability	256
■ Algebra and Functions	256
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	80
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	79

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	3,382,887
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	340,057/ 98,688
Expenditure Per Pupil *(1990)*	$3,835
Per Capita Income *(1990)*	$12,904
Percent of Children in Poverty *(1990)*	24.0
Percent of Adults with Four Years High School *(1990)*	76.6
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	.

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	36/15
Teacher Assessment for Certification *(1990)*	CK PS
Credits in Math Required for Elementary/Middle Secondary Teacher Certification in Math *(1992)*	3/NSR/ 24
Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	45
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	45
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	57
■ Algebra II	34
■ Calculus	5
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	3
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,5,7, 9,11 State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is TEXAS in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	49
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	20
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	45
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

Highest education level for a regular high school certificate.

NSR No state requirement.

UTAH

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	87
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	90

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	447,891
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	28,135/ 61,455
Expenditure Per Pupil *(1990)*	$2,545
Per Capita Income *(1990)*	$11,029
Percent of Children in Poverty *(1990)*	12.2
Percent of Adults with Four Years High School *(1990)*	88.3
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	42.3

POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	OK
Credits in Math Required for Elementary/Middle Secondary Teacher Certification in Math *(1992)*	IHE/ NSR/*
Percent of Teachers Placing Heavy Emphasis on Numbers, Operations and Measurement *(1990)*	N/A
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	[illegible]
■ Algebra II	[illegible]3
■ Calculus	[illegible]3
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	5,8,11 Stanford

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is UTAH in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

This does not include competency, proficiency, or end-of-course tests.

IHE-Course credits are established by a state-approved program of higher education.

NSR-No state requirement.

Utah requires 45 quarters for secondary certification.

VERMONT

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	90
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	88

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	95,762
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	11,502/ 112,962
[1] Expenditure Per Pupil *(1990)*	$5,270
Per Capita Income *(1990)*	$13,527
Percent of Children in Poverty *(1990)*	11.5
Percent of Adults with Four Years High School *(1990)*	83.7
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	41.4

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/ */IHE
[3] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
[3] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	5*
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	N/A
[4] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	N/A

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is VERMONT in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	NO
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[3] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with Distrct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests. NSR-No State requirement.

[4] Course credits are established by state approved program of higher education.

** Two minors are required instead of credits. Graduation requirements include five credits combined for math and science.*

Virginia

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment	
■ Numbers and Operations	268
■ Measurement	259
■ Geometry	261
■ Data Analysis, Statistics and Probability	264
■ Algebra and Functions	265
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	86
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	86

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	998,601
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	136,497/ 128,579
[1] Expenditure Per Pupil *(1990)*	$4,630
Per Capita Income *(1990)*	$15,713
Percent of Children in Poverty *(1990)*	13.0
Percent of Adults with Four Years High School *(1990)*	76.6
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	46.6

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	48/14
Teacher Assessment for Certification *(1990)*	BS PS IO CK
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/ 15/27
[2] Percent of Teachers Placing Heavy Emphasis on Numbers Operations and Measurement *(1990)*	29
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	35
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	81
■ Algebra II	65
■ Calculus	11
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	5 [3]
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[4] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,8,11 ITBS/ TAP

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is VIRGINIA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	56
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	22
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	35
State Releases a Public Report with Distnct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

[3] *This does not include competency, proficiency, or end-of-course tests.*

[4] *Total of credits in algebra I, algebra II and calculus combined for math and science.*

WASHINGTON

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	N/A
■ Measurement	N/A
■ Geometry	N/A
■ Data Analysis, Statistics and Probability	N/A
■ Algebra and Functions	N/A
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	85
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	87

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	839,709
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	98,233/ 107,570
[1] Expenditure Per Pupil *(1990)*	$4,362
Per Capita Income *(1990)*	$14,923
Percent of Children in Poverty *(1990)*	14.0
Percent of Adults with Four Years High School *(1990)*	88.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	*

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	N/A / N/A
Teacher Assessment for Certification (1990)	IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/NSR/ 24
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	N/A
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	N/A
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	N/A
■ Algebra II	N/A
■ Calculus	N/A
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	4,8,11 CTBS/ State

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is WASHINGTON in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	N/A
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	N/A
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	N/A
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests

** Mother's education not required on birth certificate*

NSR-No state requirement

West Virginia

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	260
■ Measurement	252
■ Geometry	254
■ Data Analysis, Statistics and Probability	256
■ Algebra and Functions	254
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	85
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	81

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	322,389
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	27,922/ 82,875
[1] Expenditure Per Pupil *(1990)*	$4,018
Per Capita Income *(1990)*	$10,520
Percent of Children in Poverty *(1990)*	25.9
Percent of Adults with Four Years High School *(1990)*	68.5
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	48.8

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	46/11
Teacher Assessment for Certification *(1990)*	BS PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	IHE/NSR IHE
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	31
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	28
Percent of High School Students Taking Key Math Courses *(1990)*:	
■ Algebra I	73
■ Algebra II	42
■ Calculus	2
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	YES
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	3,6,9, 11 CTBS

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is WEST VIRGINIA in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	57
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	8
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	28
State Releases a Public Report with Distnct or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.*

This does not include competency, proficiency, or end-of-course tests.

HE Course credits are established by state-approved programs of higher education.

NSR-No state requirement

Wisconsin

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	278
■ Measurement	273
■ Geometry	272
■ Data Analysis, Statistics and Probability	277
■ Algebra and Functions	271
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	90
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	90

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	797,621
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	93,978/ 101,242
[1] Expenditure Per Pupil *(1990)*	$5,020
Per Capita Income *(1990)*	$13,276
Percent of Children in Poverty *(1990)*	14.6
Percent of Adults with Four Years High School *(1990)*	80.1
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	44.5

POLICIES AND PRACTICES IN MATHEMATICS

[2] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	51/14
Teacher Assessment for Certification *(1990)*	BS PS CK IO
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	12/22/ 34
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	24
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	33
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	79
■ Algebra II	36
■ Calculus	9
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	2
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	NO
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	N/A

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along is WISCONSIN in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	YES
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	55
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	18
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	33
State Releases a Public Report with District or School Level Data	YES
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	NO

Notes:

[1] Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990.

[2] During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment.

[3] This does not include competency, proficiency, or end-of-course tests

WYOMING

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	
■ Numbers and Operations	275
■ Measurement	270
■ Geometry	270
■ Data Analysis, Statistics and Probability	274
■ Algebra and Functions	270
Percent of All 19-20 Year-Olds with a High School Credential *(1990)*	90
Percent of All 23-24 Year-Olds with a High School Credential *(1990)*	90

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	98,226
Gross State Product *(in Millions)*/Gross State Product Per School Age Child *(1990)*	11,115/ 110,328
[1] Expenditure Per Pupil *(1990)*	$5,239
Per Capita Income *(1990)*	$12,311
Percent of Children in Poverty *(1990)*	14.1
Percent of Adults with Four Years High School *(1990)*	85.3
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	35.7

POLICIES AND PRACTICES IN MATHEMATICS

[1] Percent of Math Teachers with an Undergraduate/ Graduate Major in Their Field *(1990)*	61/20
Teacher Assessment for Certification *(1990)*	No state policy
Credits in Math Required for Elementary/Middle/ Secondary Teacher Certification in Math *(1992)*	6/24/ 24
[2] Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	25
[2] Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	32
Percent of High School Students Taking Key Math Courses *(1990)*	
■ Algebra I	73
■ Algebra II	29
■ Calculus	8
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma [4] *(1990)*	*
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	N/A
[3] Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	N/A

SYSTEMIC REFORM EFFORTS

There is the view that education reform should be done systemically, that is, putting different pieces together that relate to the central objective of education. How far along WYOMING in implementing the following initiatives?

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	YES
State Developing Alternative Student Assessment in Math or Science	NO
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math Inservice)*	45
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	32
[2] Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	32
State Releases a Public Report with District or School Level Data	NO
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	YES

Notes:

[1] *Expenditure per pupil refers to the expenditure per pupil in membership for public elementary and secondary schools in fiscal year 1990*

[2] *During the 1990 NAEP Mathematics Trial State Assessment, public school teachers of the 8th grade students included in the NAEP sample were asked about the emphasis they placed on learning for each of the five content areas included in the mathematics assessment*

[3] *This does not include competency, proficiency, or end-of-course tests*

[4] *Graduation requirements are established by the local school board*

Sources

OUTCOMES

Average Proficiency of 8th Graders in Each of the Five Mathematics Content Areas as Measured by the 1990 NAEP Mathematics Trial State Assessment:	U.S. Department of Education, National Center for Education Statistics, *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States*. June 6, 1991.
Percent of All 19-20 Year-Olds with a High School Credential (1990) Percent of All 23-24 Year-Olds with a High School Credential (1990)	National Education Goals Panel. *National Education Goals Report 1992: Building a Nation of Learners*. Washington, D.C.: GPO, 1992.

BACKGROUND CHARACTERISTICS

Number of Pre K-12 Students in Public Schools *(1990-91)*	U.S. Department of Education. National Center for Education Statistics. *E.D. Tabs: Public Elementary and Secondary State Aggregate Data for School Year 1990–91 and Fiscal Year 1990*. Washington, D.C.: NCES, May 1992.
Gross State Product *(in Millions)* /Gross State Product Per School Age Child *(1990)*	U.S. Department of Commerce. Bureau of Economic Analysis. *Gross State Product 1989*. U.S. Bureau of the Census. Population Division. *State Resident Population by Age*. April, 1990.
Expenditure Per Pupil *(1990)*	U.S. Department of Education, National Center for Education Statistics, Common Core of Data. *The National Public Education Financial Survey 1990*.
Per Capita Income *(1990)*	U.S. Bureau of the Census. Income Statistics Branch/HHES Division. *Income Summary Measures by State (with Rankings) : 1989*. 1990 Census of Population.
Percent of Children in Poverty *(1990)*	U.S. Bureau of the Census. Poverty Division. *Poverty Statistics for Related Children*. 1990 Census of Population
Percent of Adults with Four Years High School *(1990)*	U.S. Bureau of the Census. Current Population Reports, Series P-20, No. 462, *Educational Attainment of the U.S.: March 1991 and 1990*. Washington, D.C.: GPO, 1992.
Percent of Mothers 18-19 Years of Age with Less Than 12 Years of School *(1988)*	National Center for Health Statistics. Division of Vital Statistics. Compiled from National Center for Health Statistics 1988 unpublished data. CCSSO State Education Assessment Center, 1991.

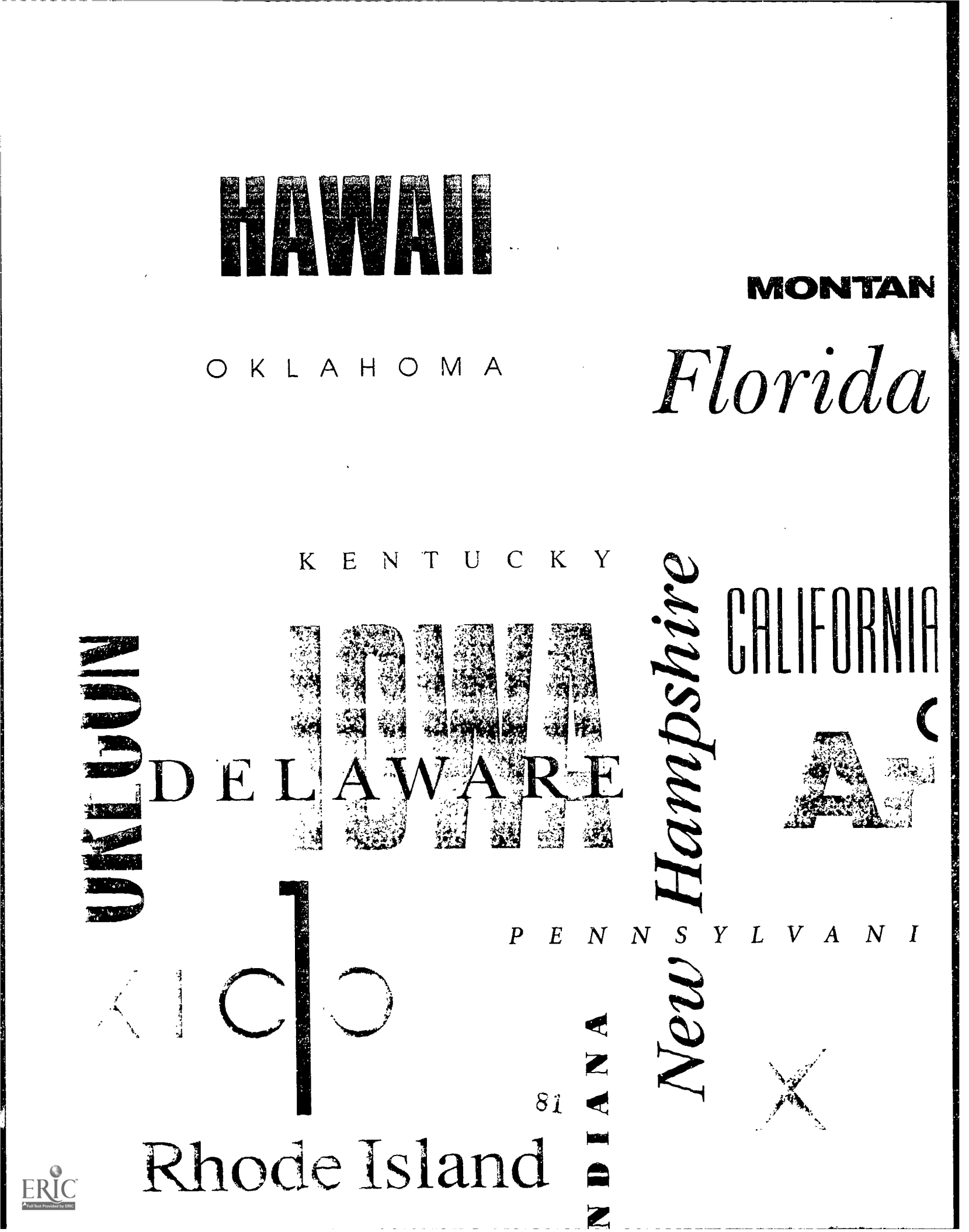
POLICIES AND PRACTICES IN MATHEMATICS

Percent of Math Teachers with an Undergraduate/Graduate Major in Their Field *(1990)*	U.S. Department of Education. National Center for Education Statistics. *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States*. June 6, 1991.
Teacher Assessment for Certification *(1990)*: BK: Basic Skills CK: Content Knowledge IO In-Class Observation PS: Professional Skills	Council of Chief State School Officers. *State Education Indicators Report 1990*. Washington, D.C., 1991.
Credits for Elementary/Middle/Secondary Teacher Certification in Math *(1992)*	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992*. Washington, D.C., 1992

Percent of Teachers Placing Heavy Emphasis on Numbers/Operations and Measurement *(1990)*	U.S. Department of Education. National Center for Education Statistics. *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States.* June 6, 1991.
Percent of Teachers Placing Heavy Emphasis on Geometry and Algebra *(1990)*	U.S. Department of Education. National Center for Education Statistics. *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States.* June 6, 1991.
Percent of High School Students Taking Key Math Courses *(1990)*:	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992.
Math Graduation Requirements in Carnegie Course Units for a Regular Diploma *(1990)*	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992.
Math Proficiency/Competency Test Required for High School Graduation *(1992)*	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992.
Grades and Source of Test Included in State's Large Scale Math Assessment Program *(1991)*	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992.

SYSTEMIC REFORM EFFORTS

Curriculum Guides or Frameworks Revised to Meet NCTM *Standards*	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992. Council of Chief State School Officers. Survey of Education Information Advisory Committee, Winter 1992.
State Developing Alternative Student Assessment in Math or Science	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992. Council of Chief State School Officers. Survey of Education Information Advisory Committee, Winter 1992.
Level of Teacher Involvement in Professional Development Opportunities *(Percent of 8th Grade Math Teachers Receiving at Least Two Days Math In-Service)*	U.S. Department of Education. National Center for Education Statistics. *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States.* June 6, 1991.
Materials and Resources are Available for Effective Teaching *(Percent of 8th Grade Math Teachers Reporting that They Receive all of the Materials and Resources They Need for Effective Teaching)*	U.S. Department of Education. National Center for Education Statistics. *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States.* June 6, 1991.
Percent of Math Teachers Placing Heavy Emphasis on Geometry and Algebra	U.S. Department of Education. National Center for Education Statistics. *The State of Mathematics Achievement: NAEP's 1990 Assessment of the Nation and the Trial Assessment of the States.* June 6, 1991.
State Releases a Public Report with District or School Level Data	Council of Chief State School Officers. *State Education Indicator Report 1990.* Washington, D.C. 1991. Council of Chief State School Officers. Survey of State Department of Education Assessment Directors. Winter, 1992.
State has Defined a Set of Learning Outcomes in Math or Math Incorporated in Core Interdisciplinary Outcomes	Council of Chief State School Officers. *State Policies on Science and Mathematics Education 1992.* Washington, D.C., 1992. Council of Chief State School Officers. Survey of State Department of Education Assessment Directors. Winter, 1992.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