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ABSTRACT

This yearbook provides a review of research concerning the differences in providing quality education to all children. A number of data sources at both the national and state levels were reviewed in compiling the indicators of educational inputs featured within this report. Four focal points are as follows: (1) the financial resources brought to bear on Minnesota's public-education system; (2) several characteristics of the state's current K-12 teaching force; (3) the changing demographics of the state's student population; and (4) the ratio of teachers and staff to students in Minnesota schools. The yearbook is divided into five chapters. Chapters 1 and 2 describe how tests have changed and provide an overview of learning. Educational inputs and processes, such as school finance and teacher characteristics, are covered in chapter 3, whereas chapter 4 focuses on participation and coursework, attendance, and graduation. The last chapter examines achievement and discusses comparative assessments. Findings include the fact that Minnesota's per-pupil funding has increased over time, but at a slower rate than for the nation as a whole. The average age of teachers has risen dramatically over the past 10 years, with 38 percent of the teachers falling into the 45-54-year-old age bracket. Minority students are characterized by higher rates of poverty, limited English proficiency, and disability. (RJM)

YEARBOOK

THE STATUS OF PRE-K – 12 EDUCATION IN MINNESOTA

Office of Educational Accountability
College of Education and Human Development
University of Minnesota

1998

OFFICE OF EDUCATIONAL ACCOUNTABILITY
University of Minnesota
College of Education and Human Development
University Technology Center
1313 Fifth Street SE, Suite B-1
Minneapolis, MN 55414-4504

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1998 MINNESOTA EDUCATION YEARBOOK: EXECUTIVE SUMMARY

The 1997 Omnibus Education Bill authorized the formation of an independent Office of Educational Accountability (OEA) to advise the education committees of the Minnesota Legislature and the Commissioner of the Department of Children, Families and Learning, at least on a biennial basis, on the degree to which the statewide educational accountability and reporting system includes a comprehensive assessment framework that measures school accountability for students achieving the goals described in the state's results-oriented Graduation Rule. The University of Minnesota's College of Education and Human Development was contracted to establish the OEA in early 1998.

The mission of the OEA is to analyze and periodically report on the needs of students and the condition of K-12 education in Minnesota, as reflected in a comprehensive set of indicators. Our reporting will be designed to inform and facilitate the improvement of elementary and secondary education on a statewide basis. It is our hope that the OEA will play an important role in enhancing the capacity of local schools and school districts to use performance information in their own continuous improvement efforts.

The educational system can be likened to a forest in which the districts and schools are the trees. This initial report attempts to examine the forest, rather than each particular tree. It is designed to be the first in a series of annual reports charting the progress of Minnesota's educational system. Data on individual schools and districts appears on the website of the Minnesota Department of Children, Families and Learning at: http://cfl.state.mn.us .

MINNESOTA: A STATE OF REFORM

Our state's current educational reform initiative, commonly referred to as the *Graduation Rule*, has its roots in at least two other major policy initiatives over the past twenty-five years (Mazzoni, 1993). The first was the school finance reform initiative of 1971, known as the "Minnesota Miracle." At that time, Minnesota began financing elementary and secondary education through the use of a minimum foundation program, which was intended to provide adequate funding for the state's public education system while compensating for variations in property wealth among the state's hundreds of local school districts.

The second major reform period began in the mid-1980s, with several pieces of successful legislation focused on school choice. The Postsecondary Enrollment Options, the "open enrollment" options program, and the formation of charter schools are all examples of Minnesota's dedication toward providing choice.

Our current drive toward standards-based reform began in 1992, when the Legislature approved the *Graduation Rule*, comprised of: (1) the *Basic Standards*, representing the minimum skills required of all students for high school graduation; and (2) a sequence of *Preparatory Standards* for grades K-8 and *High Standards* for grades 9-12 that students are expected to achieve before leaving school. New assessments followed the adoption of the Rule to evaluate

student progress toward these new standards. The *Minnesota Comprehensive Assessments* at Grades 3 and 5 assess students' mastery of the Preparatory Standards at those grade levels. The *Basic Standards Tests* of reading, mathematics and writing are now offered to students beginning in eighth grade, and must be passed before graduating from high school. And finally, performance-based assessments, or "packages" linked to the Preparatory and High standards are completed by students throughout the grades. These classroom-based assessments provide information for a *Profile of Learning* to be developed for each individual student.

The Organization of the Report

The *1998 Yearbook* is supported by a review of the research into what makes a difference in our attempts to provide quality education to all our children and youth, and builds upon earlier efforts in our state to identify the most important educational *inputs*, *processes* and *outcomes* on which to focus our collective work at helping students reach higher levels of achievement (e.g., Bruininks, Bielinski, Danielson, Davison, Erickson, Lock, Lydell, Norline-Weaver, Seppanen, Thurlow, & Ysseldyke, 1996). Educational *inputs* are commonly thought of as the human, financial and material resources brought together in teaching and learning. Indicators of educational inputs featured within this report include school finance information, teacher characteristics, student characteristics, and staffing ratios. Educational *processes* define the interactions of these inputs—shifting from the question of "what is present in the school?" to "what is happening in the school?" The process indicators included in this report include student participation in challenging high school courses, attendance patterns, and graduation rates. While we recognize graduation is commonly considered an educational goal, it has been placed within this report as a process indicator to reflect its critical importance to later achievement and student success after high school. Educational *outcomes* in this report are framed in terms of student achievement, with the performance of Minnesota students benchmarked at the international, national and statewide levels. Also included within this outcome area are indicators of the academic preparedness of college-bound students.

Our Findings on Educational Inputs

A number of data sources at both the national and state level were reviewed in compiling the indicators of educational inputs featured within this report. The report focuses primary attention on (1) the financial resources brought to bear on our state's public education system, (2) several characteristics of our current K-12 teaching force; (3) the changing demographics of our student population; and (4) the ratio of teachers and staff to students in Minnesota schools. Among our findings:

- Minnesota's per pupil funding (adjusted for inflation) has increased over time, but at a slower rate than for the nation as a whole. During the 1959-60 school year, Minnesota spent $2,177, or 13% over the national average of $1,920. In that year, Minnesota ranked tenth nationally in per pupil spending. By 1989-90, Minnesota's per pupil funding had fallen below the national average of $5,899, and did not again exceed the national average until the 1994-95 school year.

- The age distribution of Minnesota teachers has shown a dramatic change in the last ten years. In 1987-88, a majority of teachers fell in the 35–44 age bracket (40%). Today, the largest group (38%) of teachers is between 45 and 54 years old (Minnesota Department of Children, Families & Learning, 1997).

- Minority students are characterized by higher rates of poverty, limited English proficiency, and disability. If increasingly greater numbers of Minnesota's minority students are faced with these same challenges, higher rates of achievement and graduation will require new strategies for instruction and curriculum.

Our Findings on Educational Processes: Student Participation in School; and Coursework, Attendance and Graduation

Student achievement can never be realized without the active participation of students in the learning process. This report investigated several dimensions of student participation in school, including attendance rates, graduation rates, and measures of how well our students are taking advantage of course opportunities. Among our findings:

- From 1987-88 to 1997-98, the proportion of college-bound *ACT* test-takers completing a recommended basic academic core for postsecondary success has risen from 55% to 73%. This rise in preparation is extremely encouraging, but the uneven distribution of that preparation over Minnesota's ethnic groups is not.
- Increasingly, high school students in Minnesota can elect to take college level work in Advanced Placement, International Baccalaureate, and Post-secondary Enrollment Options programs, and they have been choosing to do so in increasing numbers.
- There is a decline in school attendance from fifth to twelfth grade, which may reflect the declining attendance of some students who eventually drop out of school. Stemming the decline in attendance during the secondary grades may be essential to cutting the dropout rate.
- For the state as a whole, 78% of the 1994 ninth graders in the study graduated from a Minnesota high school four years later. Eleven percent left high school, and another 11% were still enrolled in high school but had not yet completed work for their diploma.

Our Findings on Educational Outcomes: The Achievement of Our Students in International, National and Statewide Testing

Our review of the achievement performance of Minnesota students in national and international achievement testing was limited by the subject areas assessed and the grade levels included in such studies. State level achievement data was readily available for students in Grades 3, 5, and 8, due to the expansion of Minnesota's statewide testing programs. Also included in our examination was the performance of college-bound students in the ACT Assessment. Our review of the performance of Minnesota students in these various assessment programs leads us to the following conclusions about the performance of Minnesota students:

Regarding National and International Comparisons of Reading Achievement:

- Despite our state's decline in reading scores in the National Assessment of Educational Progress from 1992 to 1994, only Maine clearly outscored Minnesota students, and the reading achievement of our fourth graders remains near the top nationally. In a recent international study of reading, the United States average was significantly exceeded by that of only one country. Therefore, we can be relatively sure that Minnesota students' performance in reading would be internationally very competitive, at least at the fourth grade level.

Regarding National and International Comparisons of Mathematics Achievement:

- At both fourth and eighth grade, the achievement of Minnesota students compared very favorably to that of other states in the U.S., but in mathematics comparing favorably to other states does not make the performance internationally competitive. Based on our performance in an international mathematics assessment and an analysis of our curriculum, a re-analysis of our mathematics curriculum seems warranted.

Regarding National and International Comparisons of Science Achievement:

- Minnesota's public school eighth graders achieved an average NAEP science scale score of 159, well above the national average scale score of 148, and significantly exceeded by only two other participating states (Maine and North Dakota). In a recent international science assessment, only eighth grade students in Singapore significantly outscored Minnesota students.

Regarding the Minnesota Statewide Testing Program:

- The large number of eighth grade students failing to meet the high school minimum on the *Basic Standards Tests* remains one of the state's most pressing educational problems. By high school, students should move beyond basic skills to more challenging outcomes in core subjects, in vocational training, and in the arts. The uneven achievement of student ethnic groups in the *Basic Standards Tests* needs to be systematically addressed.

- The largest gender difference is in fifth grade writing, where 87% of girls and 74% of boys scored at or above Level II; 52% of girls and 32% of boys displayed the solid mastery of challenging material characteristic of Level III.

- The large differences among various ethnic groups in reading, writing, and math across all grades are incompatible with society's diversity goals and with our state's drive toward higher standards for all students. Any approach toward addressing the inequity of achievement among Minnesota's minority students must take into account various factors: lower attendance, higher rates of poverty, greater mobility, and higher proportions of students with disabilities and limited English proficiency.

- The achievement levels in charter schools pose a challenge to parents and to the agencies which charter those schools.

Regarding College Admissions Testing:

- While ACT college admissions scores for Minnesota declined through the 1980s, they have risen through the 1990s. Of the states with 50% or more of its students taking the ACT, only one state had an overall average scale score higher than Minnesota in the 1998 ACT administration.

- With the emphasis on minimum competency engendered by the *Basic Standards Tests*, there has been concern that the education of high ability students may be neglected. Our state's rising ACT scores and the increasingly higher course preparation of college bound students should help allay this concern.

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CHAPTER 1
INTRODUCTION

The state of Minnesota is involved in a continuing effort to evaluate and improve the quality of education for all children.

To understand the complexity of such an effort, one must remember that Minnesota's public system enrolls 840,000 students attending 2,000 school sites distributed among 350 districts. In addition, schools offer a variety of programs designed to address the needs of students, such as special education programs, orEnglish instruction for children with limited English proficiency; and any of these programs may be administered separately from the "regular" educational curriculum.

The educational system can be likened to a forest in which the districts and schools are the trees. This report looks at the forest rather than at each particular tree: it examines the entire educational system in Minnesota, not individual district or school performance. It is designed to be the first in a series of annual reports charting the progress of Minnesota's educational system. For data on particular schools and districts, the reader should consult the Minnesota Department of Children, Families, and Learning, at:

http://www.cfl.state.mn.us

This report covers the outcomes currently in Minnesota's educational reporting system, the reforms designed to enhance those outcomes, and the investments we are making to achieve them.

Chapter 2 describes Minnesota's reform efforts and briefly explains how they are different from reform efforts in other states. The reforms adopted by other states can suggest modifications to our own current efforts.

Chapter 3 describes educational inputs: school finances, the teaching faculty, student characteristics, and school characteristics. These can form the basis for a discussion of whether there are adequate resources to reach the desired outcomes.

Chapter 4 addresses issues of student participation, including courses studied, attendance, high school graduation rates, and dropping out. These behaviors are of interest for their own sake, and because they contribute to achievement.

Chapter 5 describes achievement, beginning with national and international data benchmarking the achievement of Minnesota students against that of other students and countries. It then moves to a more detailed analysis of achievement within Minnesota as reflected in the statewide tests given to all students at third, fifth, and eighth grades. Then it describes the performance of college-bound Minnesota students on the *ACT Assessment (ACT)*.

We summarize our major findings and conclusions in Chapter 6.

The vision of Minnesota's account-

MAKING CHANGE WORK

The theme of this report is change: how and what is changing in Minnesota's education system. The Minnesota Education Yearbook is designed to report on the status of education in Minnesota, and to provide information for policymakers and other stakeholders that will facilitate the process of decision making.

Much of this information is very quantitative: it measures how much, how often, how many. It describes the exact limits of the research that has been done. It takes note of where exact information has not been collected, and it enables the reader to compare pieces of information by making sure that, figuratively speaking, apples are compared to apples rather than to oranges.

Quantitative information is extremely useful. It can help us to identify exactly which students do well or poorly, help us to see whether inputs such as dollars are having the desired effect on student performance, and tell where our perceptions of the public education system do not match the reality.

However, it may not be the best way of conveying a sense of the totality of the circumstances surrounding students' or teachers' experiences with education.

The shaded boxes that appear throughout this report will help to supply some of this type of information. We will include comparisons of tests from the 1930s and today, explaining some of the major differences in what is tested and the reasons for the change. We will also include examples of real-life student and teacher experiences with the *Profile of Learning's High Standards*. These sections illustrate how the *Profile of Learning* functions in an actual school situation with real students: what a project assignment looks like, how a student might approach each kind of project, and how projects might typically be evaluated.

HOW TESTS HAVE CHANGED

In the late 1930s, Minnesota had statewide examinations in both elementary and secondary grades, administered by the Minnesota State Board of Education. Compared to our present focus on reading, mathematics, and writing, these earlier tests covered several different content areas, including English, Mathematics, Science, Geography, and Social Studies.

How does the content of yesterday's eighth grade *General Mathematics Test* compare with today's *Basic Standards Test*?

The 1938 *General Mathematics II* test was administered on Tuesday, May 31 starting at 10:15 and ran for two hours. As compared to today's *Basic Skills Test* in Mathematics, which students first take in eighth grade, the old test had more computation problems. For example:

Subtract: 8973 − 4316

Divide: $3.2\overline{)41.6}$

The 1938 test also contained definitional questions. For instance, the student had to select one term (from a list of 15 terms) that means "Profits divided among stockholders."

There were also applied problems similar to the ones which dominate today's test. For example:

Mr. Jones receives a salary check of $75 on the 1st and 15th of each month. Items spent were:

Food $20	Clothes $5.50
Rent $39	Savings $15
Gas $1.24	Books and shows $3.25
Telephone $2.75	Meat $3.00
Electricity $1.75	Milk $4.00

What is Mr. Jones' monthly salary? _____

What per cent of his salary was spent on rent? _____

Find the area and the perimeter of a square 40 rods on a side. How many acres are there in the square plot?

_____

(cont'd on p. 3)

ability and reporting system covers a broad array of indicators spanning education from pre-kindergarten to post-secondary levels. Of necessity, this reporting system will continue to develop over time, since some indicators are not available for all schools before certain dates, and other information has never been collected at all.

Future reports will cover an expanded set of indicators. For instance, early childhood education and school readiness will receive more attention in upcoming reports. Post-secondary outcomes, vocational education, arts education, school safety, and adult education are potential topics for future reports. Graduation rates and educational attainment data in Chapter 5 suggest more attention to adult education in future reports.

Besides reporting on these additional indicators, future reports will also provide trend information on key indicators to provide a better picture of our continuing progress. In compliance with statutory requirements (Minnesota Statute, §120B.30, Subdivision 1b [1998]) data on student performance featured in this initial report will serve as a baseline against which future performance can be evaluated.

Educational accountability in Minnesota is part of the state's larger, system-wide reform effort. As in many states, our reform effort is standards-driven. That is, the state and many districts began by establishing educational standards—

How Tests Have Changed *(cont'd from p. 2)*

Today, because of the widespread availability of calculators, there is less need to do mathematical calculations by hand. Students can use calculators for all but the estimation portion of the *Basic Standards Test* in Mathematics. There is more emphasis on statistics. Students must still know definitions, but they must be able to apply them practically, as in this example:

Angelo saw the figures below on his way to school. In which figure did he see the shape of a pyramid?

Figure 1

Figure 2

Figure 3

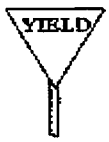
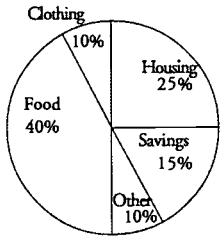


Figure 4

A. Figure 1
B. Figure 2
C. Figure 3
D. Figure 4.

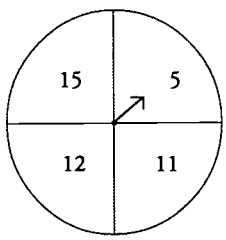
Most questions require students to apply their mathematical skills. These simple statistics problems are typical:

The circle graph below shows how every dollar could be spent from the family budget. How much money is spent for clothing out of every dollar of income?



A. $1.00
B. 10 cents
C. 1 cent
D. 156 cents

In the spinner game below, you win if you spin an odd number, and you lose if you spin an even number. What is the probability of winning?



A. 1 out of 4
B 5 out of 15
C. 3 out of 4
D. 2 out of 4

Hand calculation problems have been replaced by ones in which students must estimate the correct answer without the aid of a calculator:

The fuel cost of driving a truck is about 12 cents a mile. Approximately how much does it cost to drive a truck 96 miles?

A. $ 0.90
B. $ 6.00
C. $ 8.00
D. $12.00

statements of what students should know and be able to do at various points in the educational process.

These standards have served as guides for curriculum reform, instruction, and assessment. Most importantly, for our purposes, these standards have guided our selection of outcome indicators — measures of what students have learned and attained.

All education occurs within the context of a variety of circumstances. In order to understand what is happening now in our educational system, it is helpful to take a backward look, toward the history of educational reform in Minnesota, and in the United States.

CHAPTER 2
SCHOOLS IN AN ERA OF REFORM

The Call for Educational Reform

Like most other states, Minnesota has embarked on a major effort to transform its system of public education so that tomorrow's students are prepared to meet the challenges of the 21st century. Numerous federal education initiatives, coupled with growing public dissatisfaction over our country's present system of schooling, have fueled a serious reevaluation of our traditional notions of educational policies and practices. Communities of stakeholders at all levels are being challenged to think differently about virtually every aspect of elementary and secondary education. On a national level, several factors appear to have inspired our current interest in reform:

- National reports of declines in educational achievement
- Reports that American students' mathematics and science achievement test scores are lower than those of students from other industrialized countries
- Taxpayer concerns about whether increased spending is improving the quality and the outcomes of education
- A strongly-held perception that educational reform is the pivot of economic development
- Increasing demands that education respond to our increasing orientation toward information and technology
- Strong concerns about the poor performance of students in our core cities
- A focus on educational equity and the achievement of female, minority, and disadvantaged students.

Identifying the exact origin of these various concerns is difficult. However, in the opinion of many, the major flashpoint of public concern was the declaration in *A Nation at Risk* (National Commission on Excellence in Education, 1983) that our country's educational problems were undermining the nation's future. The resulting national discussion challenged states to improve the quality of their educational systems and, at the same time, their students' ability to compete successfully in a global market.

Standards: The Common Thread

If there is a common theme among the various state-level efforts to meet these challenges, it is undoubtedly in the articulation of *standards*, the knowledge and skills we expect our students to have. Many would argue that no other aspect of educational reform can advance without first specifically defining our expectations for learners. Among educational reformers, two different types of standards are most commonly discussed: *content* and *performance* standards.

Content standards articulate and define the knowledge and skills that are expected of students in different content areas, such as English, mathematics, and science. *Performance* standards are the established benchmarks of student performance that are linked to assessments of the content standards. While content standards answer the question, "What is it we want our students to know and to do?" performance standards address the issue of "How *well* do we expect them to know it or do it?" Many states have identified performance standards not only for students, but for schools and local school districts as well.

In 1997, the American Federation of Teachers' report, *Making Standards Matter* (1997a), stated that 49 states

Figure 2.1 Statewide Assessments by Content Area

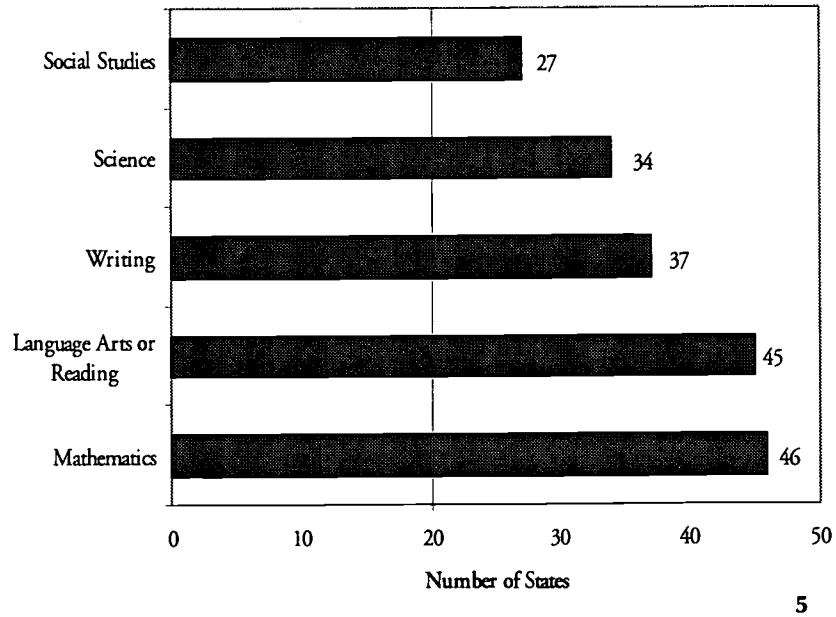
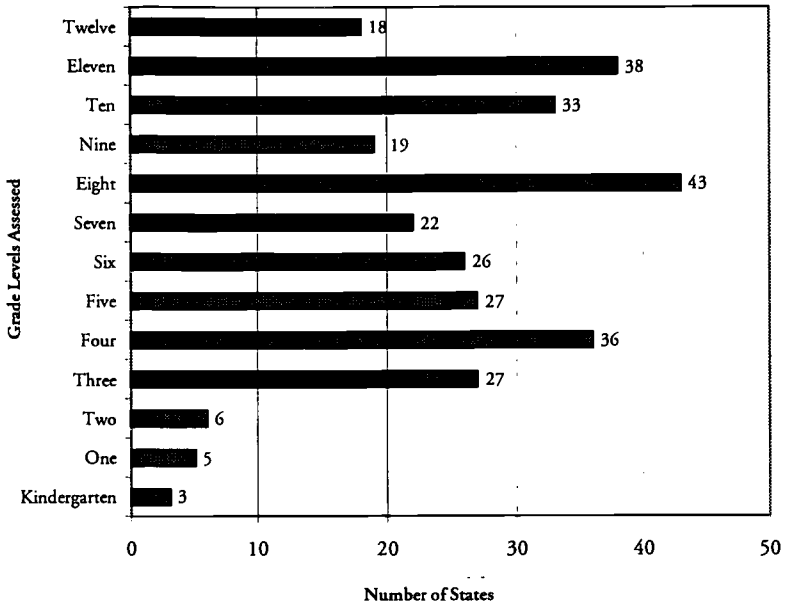


Figure 2.2 Statewide Assessments by Grade Level



are either developing or implementing a system of academic standards for students. Thirty-nine of these have developed new standards or revised their current ones within the past year. In almost all cases, states have focused on developing content standards in the four curricular content areas of language arts, mathematics, science, and social studies (Council of Chief State School Officers, 1998). These standards are the product of extensive input from various constituencies representing students, parents, teachers, school administrators, post-secondary institutions, businesses, and other community agencies.

Assessment: The Measure of Our Success

The setting of higher academic standards has guided many other components of state educational reform efforts, including school improvement programs, increased requirements for high school course work, staff development and training, and the addition or revision of school accreditation processes.

But nowhere is the influence of standard setting more readily seen than in the rapid expansion of statewide testing programs. In its latest national survey of statewide assessment programs, the Council of Chief State School Officers (Bond, Roeber, & Connealy, 1998a) found that the traditional subject areas of language arts, mathematics, writing, science, and social studies continue to be the most commonly assessed content areas in statewide assessment programs (see Figure 2.1, p. 5).

The Council's 1997 survey also revealed that states are using assessment at all grade levels, with higher rates of testing found at Grades 4, 8, and 11 (see Figure 2.2, above). Tests at these grade levels are used to measure overall student performance at the elementary, middle school, and high school levels.

Consequences in Accountability Systems

Along with higher standards, and assessment programs realigned to these standards, many would argue that real educational reform cannot be realized unless there are clear consequences attached to student performance. These consequences are often described as "stakes" for individual students, schools, or districts. The terms "low stakes" and "high stakes" express the varying levels of risk being placed on those responsible for the expected results.

In regard to *student* accountability, twenty-two states currently make, or plan to make, a high school diploma dependent upon a student's performance in particular tests commonly referred to as *graduation*, *proficiency*, or *exit* exams. Along with Minnesota, these states include Alabama, Alaska, Arizona, Florida, Georgia, Hawaii, Indiana, Louisiana, Maryland, Massachusetts, Mississippi, Nevada, New Jersey, New Mexico, New York, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Virginia.

A relatively small number of states have called for *school or district accountability* by mandating consequences for schools or districts based on their students' performance (Bond, Roeber, & Connealy, 1998b). Some of the most widely adopted measures include:

- **Probations or watch lists** *(14 states).* Schools or districts with low performance and little progress are given cautionary notice that improvements must be made within a certain time frame to avoid harsher consequences. Watch lists are usually made available to the public.
- **Accreditation loss** *(11 states).* A lack of adequate performance or progress in meeting goals leads to losing status granted through state accreditation agencies.
- **Takeover by state agencies** *(11 states).* A very high-stakes consequence often involving removal of local school board and top district administrators, with temporary governance provided by state educational officials.
- **Funding gains** *(9 states).* In this case, monies are distributed to local districts, principals, or school

staff as the result of meeting or exceeding expected student performance goals.

- **Regulatory waivers** (9 states). State educational agencies relieve local districts or schools from certain regulatory requirements in response to positive student performance.
- **Funding loss** (3 states). A high stakes consequence for low-performing schools and districts, involving the loss of state financial aid.
- **Dissolution** (4 states). This extremely high-stakes consequence results in the entire school or district being shut down under the supervision of the state's educational agency.

Researchers who have studied such reward and sanction programs have suggested that performance-based rewards do not always provide sufficient motivation for school improvements. In their study of four states using rewards for school improvement, King and Mathers (1996) found that intrinsic rewards, non-monetary recognition of improvement, and public awareness of poor performance were more motivating than money.

The Bottom Line: Accountability

Legislators and other policymakers at state and federal levels increasingly question whether greater regulation of local school *processes*—the day-to-day activities in which teachers and stu-dents, schools and districts engage— ensure excellence. Years of process monitoring by state and federal education agencies have not yielded consistent and high levels of student achievement. Thus, attention has begun to focus on the *results* of our educational endeavors, rather than on the specific methods used to meet our goals.

With the advent of new governing structures like site-based management, choice options, and charter schools, schools have been given increasingly more autonomy in developing specific curricula, programs, and instructional approaches. But this autonomy has a corresponding expectation—namely, that school systems, schools, and students will now be held accountable for meeting certain articulated results. It is a political tradeoff that grants an increase in local control of operations, but requires schools to meet

OVERVIEW OF THE PROFILE OF LEARNING

The *Profile of Learning* is a framework of standards-based education and applied learning. It is designed to assure accountability for individual student results and to ensure that students actually experience the learning that is necessary in order to function successfully in post-secondary education and in the work world.

In the *Profile of Learning*, experiences are organized into ten Learning Areas (see Learning Areas table, p. 8). The Learning Areas represent complex skills and processes that build sequentially through the primary, intermediate, middle, and high school levels. While the categorization of requirements in the *Profile of Learning* is somewhat different from the traditional subject categories employed in most schools, there is a clear relationship. For example, Learning Areas 4 and 6 focus on math and science respectively. Learning Areas 1 and 2 elaborate the essential components of communication: reading, writing, and speaking.

Within each Learning Area, there are specific standards that must be met. The term, *"standard,"* refers to what students should know and be able to do. The standards required in K-8 are called *Preparatory Standards*. These *Preparatory Standards* ensure that students have sufficient content background and skills to pursue the *High Standards* in high school. For example, in Learning Area 2, high school students may choose to emphasize academic writing or technical writing, after having completed preparatory standards in both kinds of writing. (See CFL web site http://cfl.state.mn.us/grad/highstandards.htm .)

To evaluate student progress on the *Preparatory Standards*, Minnesota teachers, national testing experts, and the Department of Children, Families, and Learning (CFL) developed the *Minnesota Comprehensive Assessments (MCA)* for third and fifth graders. These tests also measure the success of schools and districts in improving achievement over time. They are used to generate information for school improvement and accountability, and they allow for comparison of schools and districts.

To graduate from high school, students must meet 24 of 48 possible *High Standards*. Students demonstrate what they know and are able to do by completing several assignments. These assignments or "performance packages" (developed locally based on Department of Children, Families, and Learning models) are designed to assess a student's ability to meet the standard. In the course of this report, we will look at several performance packages.

The score a student receives on a content standard is determined by the teacher or school district designee, after taking into account the level of accomplishment at which a student performs on a series of tasks (the performance package) representing an entire content standard. Within the performance packages, checklists provide feedback to the students about their work relative to the content standard. The progress guidelines consist of a Y (yes), meaning that the student has met the performance task; or an N (no) if the student has not met the performance task. Once the student has attained all Y's on the performance tasks (satisfying the content standard requirements), their work will be evaluated. The scoring criteria for the completed content standard is based on a four point scale:

4 - *Exemplary:* Indicates evidence of student learning in all parts of the standard at a level that exceeds expectations by using and applying knowledge consistently in new and insightful ways.

(cont'd on p. 8)

more externally imposed expectations.

Minnesota's Legacy of Educational Innovation

Educational reform calls for innovation, a term that is often used to describe Minnesota's educational policies. Our state's current reform initiative, commonly referred to as the *Graduation Rule,* has been preceded by at least two other major policy initiatives over the past twenty-five years (Mazzoni, 1993).

The first was the school finance reform initiative of 1971, known as the "Minnesota Miracle." At that time, Minnesota began financing elementary and secondary education through the use of a minimum foundation program, which was intended

(cont'd from p. 7)

3 - *Proficient:* Indicates evidence of student learning in all parts of the standard at a consistently proficient level.

2 - *Novice:* Indicates evidence of student learning in all parts of the standard at an adequate level some or all of the time.

1 - *Emerging:* Indicates evidence of student learning in all parts of the standard at a superficial level some or all of the time.

The Minnesota *Graduation Rule* recognizes that, while all students need a comprehensive educational experience to prepare them for lifelong learning, people are different, having different skills, interests, and areas of strength and weakness. Therefore, the *Graduation Rule* does not demand that all students achieve outstanding levels of performance in all areas. Rather, individual achievement on content standards produces a student *profile,* indicating those areas and standards in which the student excels and those in which the student has not achieved at a high level.

The *Graduation Rule* also recognizes individual learning styles and preferences by allowing the achievement of High Standards in varied contexts, programs, courses, and learning environments. The *Graduation Rule* is also working to establish a consistent means of recording and reporting student results as scored against high quality examples of excellent achievement. This information – this *profile* – will help the student, and those who teach and employ the graduate later, to recognize both strengths and needs for further experiences and learning.

1. Read, View and Listen Read, view and listen to complex information in the English language	2. Write and Speak Write and speak effectively in the English language	3. Arts and Literature Apply and interpret artistic expression	4. Math Applications Solve problems by applying mathematics	5. Inquiry Conduct research and communicate findings
High School	High School	High School	High School	High School
Middle (6-8)	Middle (6-8)	Middle (6-8)	Middle (6-8)	Middle (6-8)
Intermediate (4-5)	Intermediate (4-5)	Intermediate (4-5)	Intermediate (4-5)	Intermediate (4-5)
Primary (K-3)	Primary (K-3)	Primary (K-3)	Primary (K-3)	Primary (K-3)

6. Scientific Application Understand and apply scientific concepts and methods	7. People and Cultures Understand interactions among people and cultures	8. Decision Making Use information to make decisions	9. Resource Management Manage resources for a household, community or government	10. World Languages *Optional* Communicate in a language other than English
High School	High School	High School	High School	High School
Middle (6-8)	Middle (6-8)	Middle (6-8)	Middle (6-8)	Middle (6-8)
Intermediate (4-5)	Intermediate (4-5)	Intermediate (4-5)	Intermediate (4-5)	Intermediate (4-5)
Primary (K-3)	Primary (K-3)	Primary (K-3)	Primary (K-3)	Primary (K-3)

to provide adequate funding for the state's public education system while compensating for variations in property wealth among the state's hundreds of local school districts. Currently, Minnesota schools receive a higher proportion of state funding than do schools in many other states. During 1994–95, 52% of Minnesota's school operating expenses came from state sources, as compared to 47% nationally (Snyder, 1997).

The second major reform period began in the mid-1980s, with several pieces of successful legislation focused on school choice. In 1985, the Postsecondary Enrollment Options Act (PSEO) made it possible for Minnesota high school juniors and seniors to enroll in courses or programs at eligible postsecondary institutions. By 1988, the state legislature had initiated the K–12 "open enrollment" options program, allowing all students the chance to attend schools outside of their resident district. In 1991, the ground-breaking legislation for the formation of charter schools was passed. Even before these initiatives, Minnesota had established itself as a proponent of school choice by allowing tax deductions for the educational expenses of all families, including tuition expenses of families with children in non-public schools.

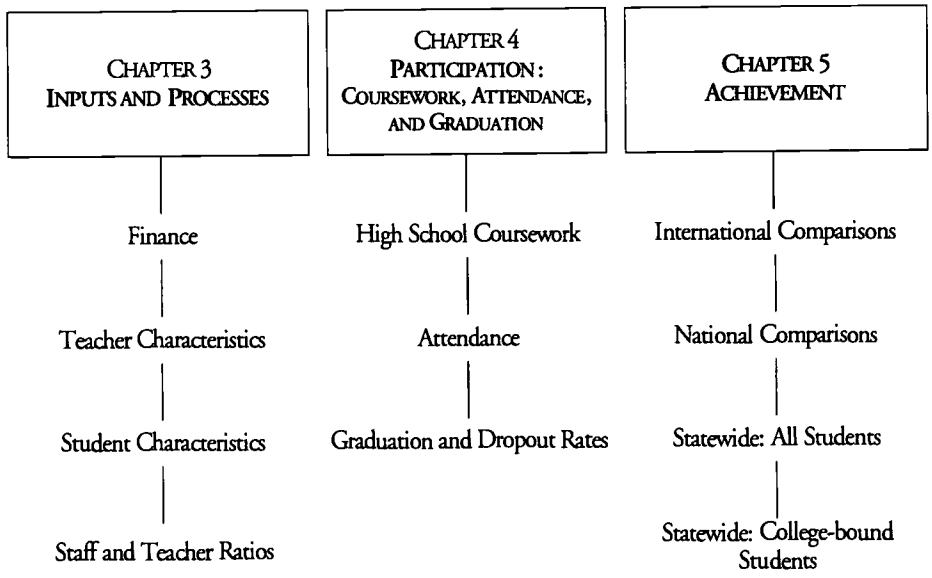
Minnesota's present drive toward a results-oriented educational system began during this time period as well. Although early efforts at reform were organized under the banner of Outcomes-Based Education (OBE), considerable resistance against OBE and its perceived intrusiveness on local instructional practices eventually shifted the initiative toward a focus on performance-based graduation standards.

In 1992, the Legislature approved a standards-based *Graduation Rule,* which included two distinct components: (1) the *Basic Standards,* representing the minimum skills required of all students for high school graduation; and (2) a sequence of *Preparatory Standards* for grades K–8 and *High Standards* for grades 9–12, which students are expected to achieve before leaving school.

The need to assess the minimum standards has since led to the establishment of *Basic Standards Tests* in reading, mathematics, and written composition for students at or above the eighth grade. With certain exceptions for students with limited English proficiency and students with disabilities, students must pass these exams before they can receive their high school diplomas. In contrast to the measures of basic standards, "performance packages" are designed by classroom teachers to measure each student's attainment of the *Preparatory* and *High Standards.*

In 1997, additional legislation called for schools and districts to be evaluated on their ability to help students achieve the *Preparatory* and *High Standards* through the administration of a series of standardized assessments. Given in the 1997–98 school year for the first time, the *Minnesota Comprehensive Assessments* (MCAs) measure third and fifth graders' mastery of the *Preparatory Standards* in reading and mathematics. The MCAs also measure fifth graders' writing skills. While no student consequences are attached to the MCA testing program, the scores show the public and policymakers how well schools and districts are doing at helping their students attain higher academic standards.

Figure 2.3 Educational Indicators Covered in Chapters 3–5



The remaining chapters of this 1998 Yearbook categorize discussion around three interrelated components of our educational system (as shown in Figure 2.3).

CHAPTER 3
EDUCATIONAL INPUTS AND PROCESSES

INTRODUCTION

Because of its inherent value to our democracy and economic vitality, public education is one of the most important, and costly, enterprises of any state. In this chapter, we report on several of the characteristics of our schools and students that are brought together in the educational enterprise, and reflect on how the current status of each of these may be contributing to the results of our efforts.

THE RELATIONSHIP OF FINANCIAL RESOURCES AND ACHIEVEMENT

Does the application of additional financial resources improve student success and achievement? This fundamental question, perennially posed by educational stakeholders at all levels, has no simple answer. Researchers vary widely in their conclusions about the effects of increased funding on achievement. Increased funding can buy smaller class size, higher teacher salaries, and more experienced teachers, all of which are associated with better outcomes (Greenwald, Hedges & Laine, 1996). But these factors, in and of themselves, do not assure improved student performance on the intended outcomes (Hanushek, 1989). The proper application of additional school finances appears to depend on three critical factors:

1. ***A clear articulation of the expected application of additional funds and the expected outcomes.*** Much of our inability to assess the impact of additional funding is based on the fact that the discretionary control exerted over additional funding by schools and districts often leads to a redirection of these appropriated funds to other areas in need. Such local reappropriation may well produce positive results, but in areas other than what was initially intended.

2. ***A careful consideration of the interactive effects among the various factors known to be associated with achievement.*** Many of the educational inputs known to be associated with higher levels of student achievement are interrelated, and must be carefully balanced if additional funds are to be applied effectively. For example, the positive effects of lowering class size in a school or district may be inadvertently diminished or lost if such a policy reduces the local agency's ability to hire more experienced teachers.

> *Minnesota's per pupil funding (adjusted for inflation) has increased over time, but at a slower rate than for the nation as a whole. During the 1959–60 school year, Minnesota spent $2,177 per pupil, or 13% over the national average of $1,920. In that year, Minnesota ranked tenth nationally in per pupil spending. By 1989–90, Minnesota's per pupil funding had fallen below the national average of $5,899, and did not again exceed the national average until the 1994–95 school year.*

3. ***A perspective that views improvement in curriculum and instruction as the primary means through which positive changes can occur.*** Additional funding might best be understood as a secondary or *enabling* factor that can open the door for other changes more central to the mission of teaching and learning. Increased funding can only succeed when it leads to tangible improvements in how well teachers can teach and students can learn.

FINANCING PUBLIC EDUCATION IN MINNESOTA

Figure 3.1 (p. 12) reveals that Minnesota's per pupil funding (adjusted for inflation) has increased over time, but at a slower rate than for the nation as a whole. During the 1959–60 school year, Minnesota spent $2,177 per pupil, or 13% over the national average of $1,920. In that year, Minnesota ranked tenth nationally in per pupil spending. By 1989–90, Minnesota's per pupil funding had fallen below the national average of $5,899, and did not again exceed the national average until the 1994–95 school year.

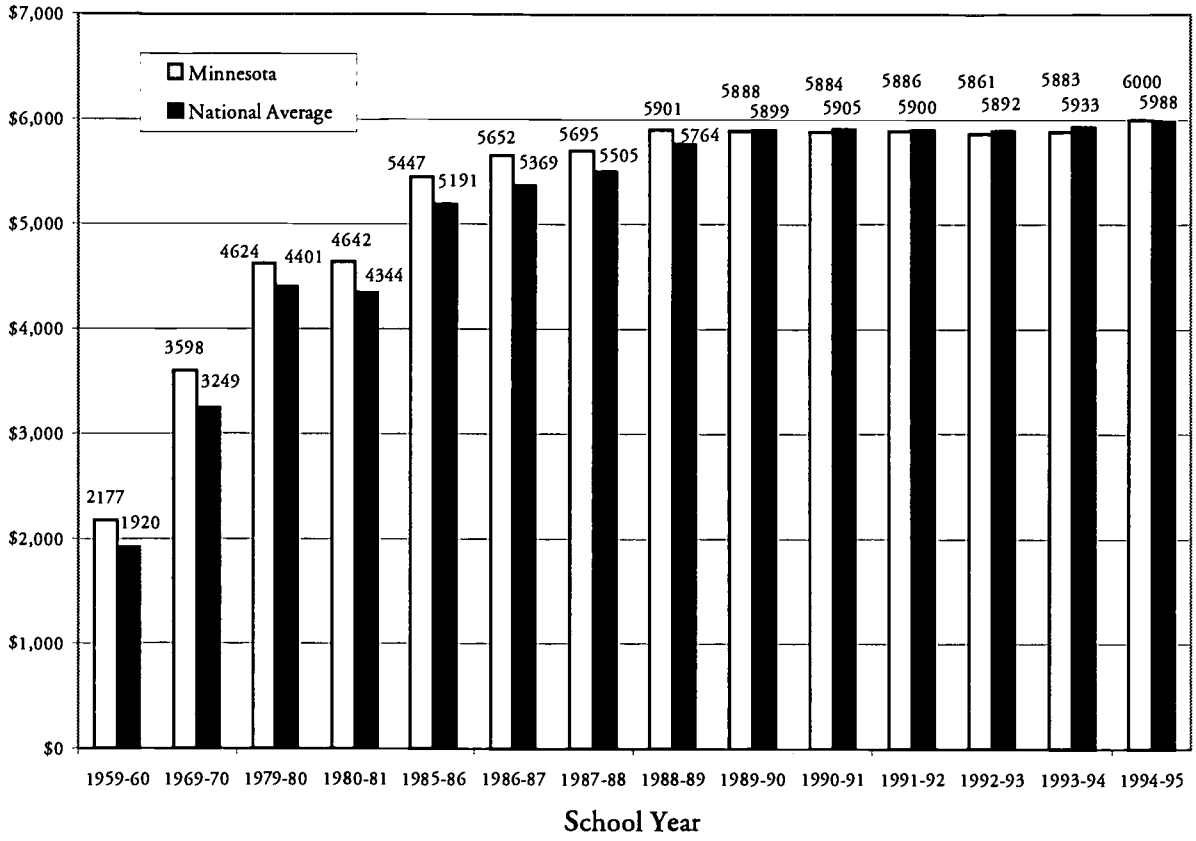
EXAMINING THE SOURCES OF SCHOOL FUNDING

A closer look at the sources of funding for our state's pre-K–12 educational system reveals some interesting differences between Minnesota and other states. Generally speaking, school revenues are predominantly gathered through three funding streams:

- Local sources, most commonly through property taxes
- State allocations
- Federal funding, which is typically targeted toward specific disadvantaged groups

Whenever school funding has come

Figure 3.1 Expenditures Per Pupil in Average Daily Attendance: Minnesota and the National Average



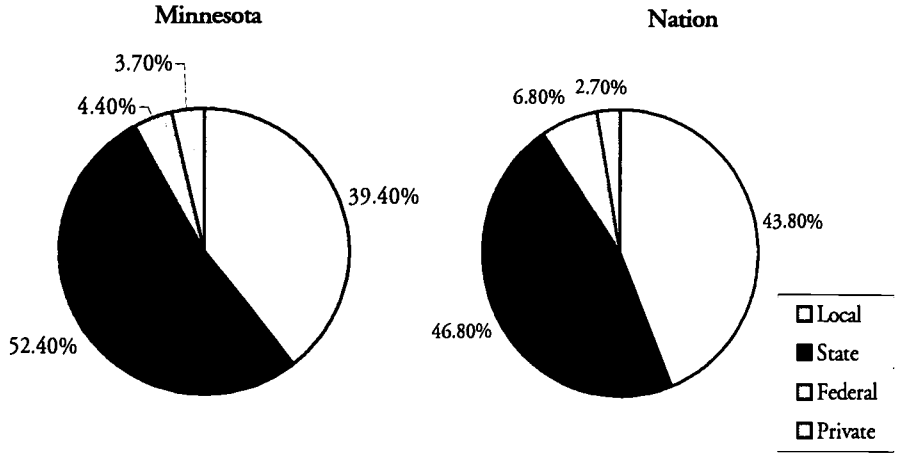
to depend too heavily on locally generated funding sources, districts with high proportions of economically and educationally disadvantaged students have tended to have lower per pupil funding due to their lower property wealth. In recent years, many states have begun to fund proportionately more of their elementary and secondary programs through state allocations rather than local sources, in an attempt to alleviate this inequity.

The Minnesota and the national funding proportions for the 1994–95 school year, the last year for which comparative data for other states is available, are shown in Figure 3.2 (Snyder, 1997). Overall, Minnesota ranked 18th nationally on per pupil funding received from state allocations: 52.4% of Minnesota's funds came from state sources as compared to 46.8% nationally. In Minnesota, 39.4% came from local sources, as compared to 43.8% in other states. Private contributions were above the average; Minnesota was 14th out of 50 states. Private sources supported 3.7% of the cost of education in Minnesota, as compared to 2.7% nationally. Private sources include revenues from gifts, tuition, and fees from patrons. Finally, Minnesota received less support for education from the federal government than do most other states. Our federal contribution is 4.4% compared to 6.8% nationally, with Minnesota ranking 46th out of 50 (Snyder, 1997).

How Minnesota's Education Dollars are Spent

Increasingly, as Minnesota has moved toward statewide funding, it has addressed two types of disparities across districts: differences in local tax

Figure 3.2 Proportion of School Funding Received Through Federal, State, Local, and Private Funding Sources, for Minnesota and the Nation



bases and in the distribution of high need students across districts.

Differences in local tax bases have been addressed through the foundation formula, which is designed to provide a basic foundation of funding for all districts irrespective of local resources. It channels more state aid to districts with low residential and commercial tax bases.

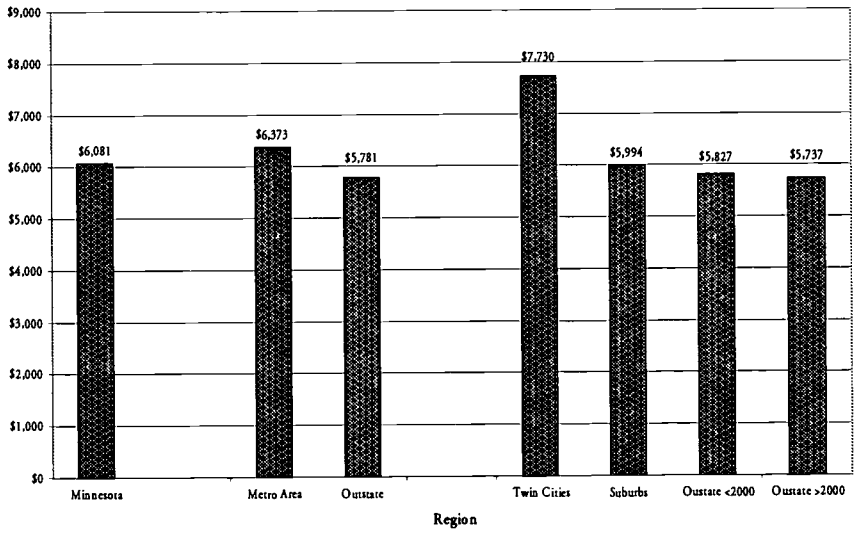
Low levels of educational attainment are associated with factors such as poverty, limited English proficiency, and disabilities, and some districts in Minnesota have heavier concentrations of these factors than do others. Both federal and state funds have been used to address needs created by this uneven distribution of high need students across districts. Federal Title 1 funding is targeted toward students from low-income families, while additional federal, state, and local dollars go toward supporting students with disabilities in special education programs. Certain state and federal funds are also dedicated to children of migrant workers and to Indian education.

Other state funds are targeted to help assure basic levels of education for low-achieving students. Under the general category of "Basic Skills" revenue, these funds include compensatory education dollars (most heavily targeted to districts with heavy concentrations of poverty) and funding for students with limited English proficiency. To help prevent low achievement before it starts, state-funded learning readiness and first grade preparedness programs help students begin their education prepared to learn.

Like most other states, Minnesota is involved in a continuing debate as to whether the funding formulas adequately recognize disparities in local funding sources and the challenges faced by districts with high proportions of students with special needs. In any case, differences in funding levels across districts reflect, in part, state and federal efforts to address disparities in local funding capacities, the unequal distribution of at-risk students, and the drive to assure a basic education for all students. Differences in per pupil spending between districts (see Figure 3.3, below), particularly between Minneapolis/St. Paul and other districts, reflect the uneven distribution of students with special needs (see Figure 3.4, below right). It should be noted that we have not adjusted any figures for differences in costs of living.

Minnesota school expenditure data are reported in eleven categories (see Table 3.1, page 14). At a state level, regular classroom expenditures are allocated about half of the total expenditures. Exceptional instruction (non-regular instruction of students with special characteristics such as those with disabilities) account for approximately 15% of the total expenditures. When taken together, expenditures in the four instructional categories (regular, exceptional, vocational, and instructional support) account for approximately 70% of the total per pupil expenditure statewide, as compared to the average expenditures for administration (approximately 5%), and for build-

Figure 3.3 Per Pupil Operating Expenditures by Minnesota Region



Note: Operating Expenditure excludes capital outlays, debt service, community service, and building construction.

Figure 3.4 Percentage of Students with F/R Lunch, and Students with LEP, by Minnesota Region

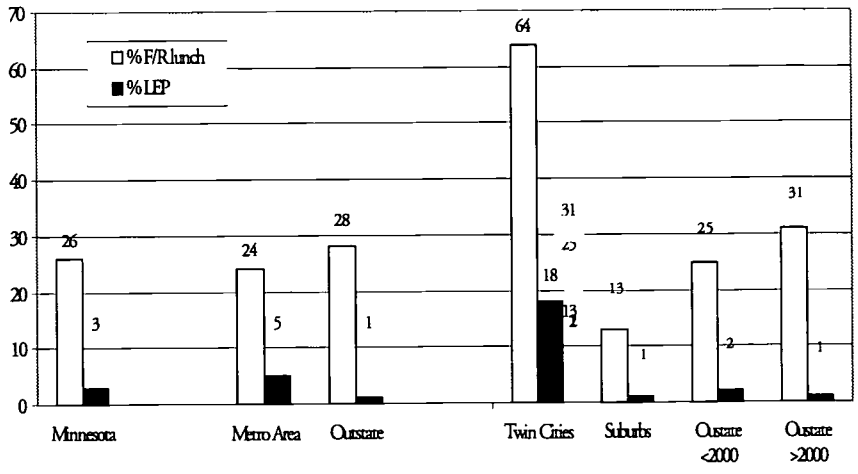


Table 3.1 1996-97 Per Pupil Operating Expenditures in Dollars and Percent of Total

	Region		Strata			
	Metro Area Region	Outstate Region	Mpls/St. Paul	Suburbs	Outstate: 2000+	Outstate: 2000-
Demographics						
% Eligible for F/R Lunch	24	28	64	13	25	31
% LEP	5	1	18	1	2	1
% Special Education	10	11	12	10	11	11
Mobility Rate	20	15	38	14	18	12
Expenditure Category						
Administration	332 (5)*	345 (6)	350 (4)	327 (5)	303 (5)	385 (7)
Support Services	208 (3)	136 (2)	267 (3)	192 (3)	133 (2)	138 (2)
Regular Instruction	3017 (48)	2824 (49)	3505 (46)	2881 (48)	2780 (48)	2867 (50)
Vocational Instruction	121 (2)	135 (2)	108 (1)	125 (2)	138 (2)	131 (2)
Exceptional Instruction	993 (15)	803 (14)	1421 (18)	873 (14)	905 (15)	704 (12)
Instructional Support	334 (5)	242 (4)	409 (5)	313 (5)	272 (5)	214 (4)
Pupil Support	222 (3)	145 (3)	330 (4)	192 (3)	173 (3)	118 (2)
Operations/Maintenance	530 (8)	510 (9)	632 (8)	501 (8)	505 (9)	514 (9)
Food Service	259 (4)	252 (4)	301 (4)	247 (4)	235 (4)	269 (5)
Pupil Transportation	345 (5)	349 (6)	471 (6)	310 (5)	345 (6)	352 (6)
Other Operations	12 (0)	41 (1)	-65 (-1)**	34 (1)	37 (1)	44 (1)
Total Operating	6373	5781	7730 ***	5994	5827	5737

Note: The 1996-97 Average Per Pupil Expenditure for Minnesota was $6,081. *Numbers in parentheses represent the percentage of each per-pupil dollar spent in a category. ** A negative value represents an expenditure surplus. ***This figure is a weighted average of per pupil expenditures for Minneapolis ($8344) and St. Paul ($7701).

ing operations and maintenance (approximately 9%).

Table 3.1 (above) reveals differences in resource allocation between the metropolitan area and outstate Minnesota, as well as between districts in different strata. The outstate region spends a slightly greater percentage of each per pupil dollar for regular instruction, operations and maintenance, and administration (64%) than does the metro area (61%). This difference is offset by a lesser percentage of per-pupil expenditure by schools in the outstate region for support services, exceptional instruction, and instructional support (20%) as compared to spending on these categories in the metro area (23%).

The differences are greater among the four strata (Minneapolis/St. Paul, suburban, larger outstate districts (more than 2,000 students), and smaller outstate districts (2,000 students or less). Particularly evident is the fact that, compared to the other three strata, Minneapolis and St. Paul spend a smaller percentage (though not necessarily a smaller amount) on administration, regular instruction, and vocational instruction. Schools in Minneapolis and St. Paul offset this difference by spending a substantially greater percentage of per pupil dollars on exceptional instruction. The largest differences occur between Minneapolis/St. Paul schools and smaller outstate schools. Outstate schools spend 7% of each per pupil dollar on administration, compared to only 4% spent for the same function by Minneapolis/St. Paul schools. Smaller outstate schools also spend 50% of each per pupil dollar on regular instruction, whereas Minneapolis/St. Paul schools spend 46% of each dollar for regular instruction. Additionally, the small outstate schools spend a substantially smaller portion of each dollar on exceptional instruction (12%), compared with 18% for Minneapolis and St. Paul schools. There is very little difference in the expenditure pattern of suburban districts and larger outstate districts.

Teacher Characteristics

When searching for the reasons

behind higher levels of student academic achievement, both researchers and the public can easily agree on one thing: quality teaching is essential to learner success. In order to provide a basis for discussion about what constitutes quality teaching, we must look at certain characteristics of the teaching force in Minnesota, and examine how our teachers compare to their peers across the nation.

Levels of Teacher Education and Experience

When examining the relationship between teaching and achievement, many researchers (Dolan & Schmidt, 1987; Ferguson, 1991; Wright, Horn & Sanders, 1997) agree that the quality of the teaching staff makes a difference in student achievement. What contributes to "teacher quality"? In their review of 60 studies examining the impact of various factors on student achievement, Greenwald, Hedges & Laine (1996) found that increased levels of teacher education, teacher experience, and teacher salaries are associated with significant increases in student achievement. They also point out that there is vigorous debate about the size of the contribution made by each of these factors.

With regard to levels of teacher education, approximately 53% of the nation's teachers held a Master's degree in 1990, up from 40% in 1975 (American Federation of Teachers [AFT], 1997b). In 1996–97, 42% of Minnesota's teaching force possessed a Master's degree or above.

Minnesota teachers had slightly more years of teaching experience (16 years) compared to the national average (15.2 years) in 1997. This gives Minnesota a rank of 18th out of the 50 states, in terms of average years of teacher experience (AFT, 1997b).

Table 3.2 shows differences in the educational attainment and years of experience among the population of fulltime teaching professionals serving Minnesota public schools during the 1996-97 school year. A greater proportion of male teachers (46%) held at least a Master's degree than their female counterparts (40%). The metropolitan area had a greater proportion of teachers with advanced degrees (52% of the teaching force) compared to outstate Minnesota (33%). This may be due to several factors, among them the easier access to advanced degree programs in the Twin Cities area.

The average length of teaching experience varies in interesting ways among Minnesota teachers. Male teachers in Minnesota have taught an average of three years longer than have female instructors (18 years vs. 15 years). Teachers in outstate Minnesota,

Table 3.2 1996-97 Minnesota Teachers Profile: Full-time Teachers (100% FTE)

	N	% of Teachers Holding BA or Higher	% of Teachers Holding MA or Higher	Average Years of Teaching Experience	Average Teacher Salary	Average Teacher Age	Number of Teachers Aged 55 or Over	Number of Teachers Aged 60 or Over
Total	44874	100	42	16	38232 *	44	6952	1817
Females	29671	100	40	15	37905	44	4078	1237
Males	14555	100	46	18	39367	45	2874	580
Elementary	22758	100	41	16	38649	44	3422	1016
Secondary	20086	100	43	16	37989	44	3357	742
Metro Area	21518	100	52	15	41008	44	3534	923
Outstate	22158	100	33	17	35707	44	3302	853
Mpls/St. Paul	5081	100	52	15	43098	45	923	322
TC Suburbs	16437	100	52	16	40363	44	2611	601
Outstate: 2000+	10643	100	45	16	37916	44	1767	444
Outstate: 2000-	11515	100	22	17	33664	44	1535	409

* This figure varies slightly from the AFT average given on p. 16.

on average, have taught two more years than metropolitan teachers. More specifically, teachers from districts having less than 2000 students edge out their counterparts from all other strata, with an average of 17 years of teaching experience.

The age distribution of Minnesota teachers has shown a dramatic change in the last ten years. In 1987-88, a plurality of teachers fell in the 35-44 age bracket. Today, the largest group of teachers is between 45 and 54 years old.

Teacher Salaries

The nation's average teacher salary for 1996-1997 was $38,436, representing an increase of 2.2% from the previous year. For the same period, the Minnesota average teacher salary was $38,276, giving Minnesota a rank of 18th nationally. However, states vary considerably in their economic condition and cost of living. When cost-of-living differences are accounted for, Minnesota's adjusted average teacher salary rose to $39,598, and our adjusted rank rose to 13th out of the 50 states (AFT, 1997b).

Table 3.2 (p. 15) shows that male teachers in Minnesota have a higher average salary than female teachers, possibly because male teachers may be more likely to hold an advanced degree, and because male teachers overall have a greater average number of years of experience. Elementary and secondary teachers' salaries are vir-tually equivalent, but there are considerable differences between metropolitan and outstate teachers.

Analyzing the data by region, we find that teachers in the Twin Cities average almost five thousand dollars more in annual salary than teachers outstate ($41,008 vs. $35,707). Cost of living and the number of teachers holding advanced degrees may account for these differences.

Age of Teaching Force

The age distribution of Minnesota teachers has shown a dramatic change in the last ten years. In 1987-88, a plurality of teachers fell in the 35-44 age bracket (40%). Today, the largest group of teachers (38%) is between 45 and 54 years old (Minnesota Department of Children, Families & Learning, 1997). Table 3.2 reveals that almost 7,000 of Minnesota's teachers are over 55 years old, with slightly over 1,800 of those at or above age 60. The number of teachers at or over 55 years of age is approximately 16% of the total professional teaching force in Minnesota. A larger percentage of these teachers are female, mirroring the larger proportion of females in the field in general.

While fairly evenly distributed between elementary and secondary settings, the greatest number of teachers in the upper age groups are found in the suburban districts surrounding Minneapolis and St. Paul.

Student Characteristics

Commonly, reports of this type include a lengthy section on student characteristics. We have placed extensive student characteristics data elsewhere (Chapter 5: Achievement) to provide context for the achievement information. That chapter contains data on rates of poverty, limited English proficiency, mobility, and disability (special education placement) for students taking the achievement tests. In this section, we merely underscore what many others have said about the changing nature of American and Minnesota schools.

From 1987 through 1994 the percentage of Black, Asian, and Hispanic students in Minnesota almost doubled (Minnesota Department of Children, Families & Learning, 1997). The percentage of ethnic minority students in Minnesota increased from 6.1% in 1987 to 11.1% in 1994.

The changing composition of students is clearly evident when one examines the percentages of various ethnic minority groups at each grade (see Table 3.3). The best indicators of the growing minority population are grades kindergarten through eighth grade, grades in which dropping out seldom occurs. During these grades, changes in enrollment are principally affected by birth rates, immigration, and migration.

Shifting demographics may have an impact on state average test scores and graduation rates in the years to come. Minority students are characterized by higher rates of poverty (indicated by the percentage of students eligible for free or reduced-price lunch), limited English proficiency, and disability (indicated by placement in special education), as seen in tables 5.7 – 5.13 (pp. 39-42). If increasingly greater numbers of Minnesota's minority students are faced with these challenges, higher rates of achievement and graduation will require new strategies for instruction and curriculum.

Minority students are characterized by higher rates of poverty, limited English proficiency, and disability. If increasingly greater numbers of Minnesota's minority students are faced with these challenges, higher rates of achievement and graduation will require new strategies for instruction and curriculum.

Finding new strategies is an issue throughout the state, not just for the core cities, although the core cities carry the heaviest responsibility. Figure

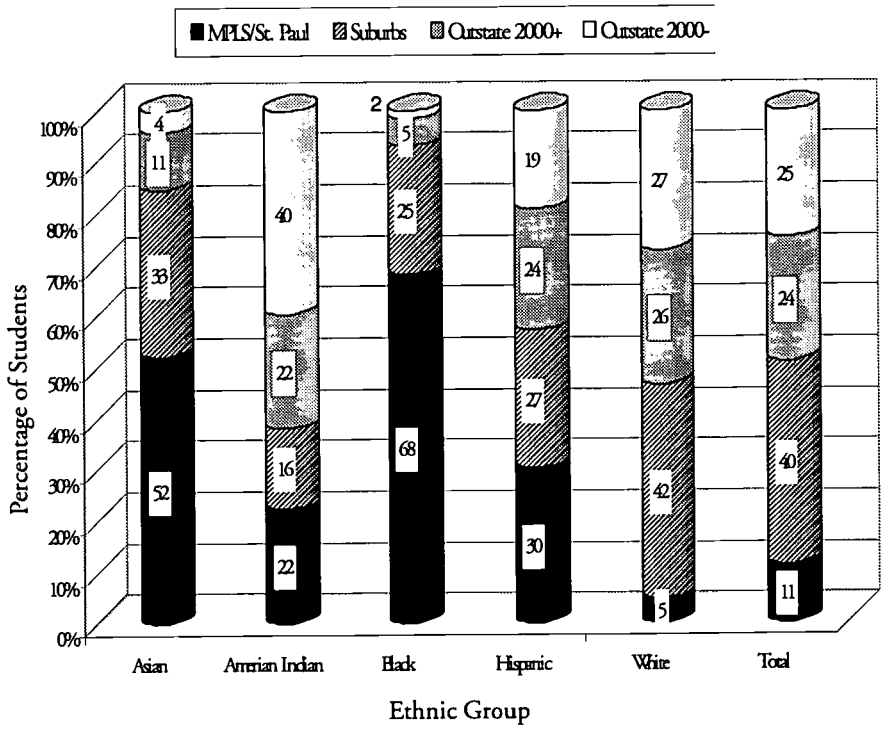
Table 3.3 Number of Students for Each Ethnic and Gender Group by Grade, for the 1997-98 School Year

Grades Largely Unaffected by Dropout								
Grade	Boys	Girls	Amer Ind	Asian	Black	Hispanic	White	Total
K	32126 (52%)	30000 (48%)	1361 (2%)	2940 (5%)	4593 (7%)	2093 (3%)	51139 (82%)	62126
1	32320 (52%)	30019 (48%)	1456 (2%)	2955 (5%)	4443 (7%)	2022 (3%)	51463 (83%)	62339
2	33057 (52%)	31087 (48%)	1412 (2%)	3154 (5%)	4398 (7%)	2003 (3%)	53243 (83%)	64131
3	32391 (51%)	31237 (49%)	1388 (2%)	2986 (5%)	4158 (6%)	1753 (3%)	53343 (84%)	63628
4	32731 (52%)	30763 (48%)	1362 (2%)	3137 (5%)	3972 (6%)	1690 (3%)	53333 (84%)	63494
5	32747 (52%)	30689 (48%)	1340 (2%)	2913 (5%)	3681 (6%)	1538 (2%)	53964 (85%)	63436
6	33737 (51%)	31903 (49%)	1406 (2%)	3076 (5%)	3460 (5%)	1552 (2%)	56146 (86%)	65640
7	34675 (51%)	32791 (49%)	1374 (2%)	2903 (4%)	3506 (5%)	1499 (2%)	58184 (86%)	67466
8	34095 (51%)	32431 (49%)	1389 (2%)	2957 (4%)	3172 (5%)	1521 (2%)	57487 (86%)	66526

Grades Affected by Dropout								
Grade	Boys	Girls	Amer. Ind.	Asian	Black	Hispanic	White	Total
9	35491 (52%)	33248 (48%)	1389 (2%)	2965 (4%)	3546 (5%)	1507 (2%)	59332 (86%)	68739
10	35099 (51%)	33304 (49%)	1235 (2%)	2809 (4%)	3107 (4%)	1337 (2%)	59915 (88%)	68403
11	33065 (51%)	31663 (49%)	1045 (2%)	2456 (4%)	2506 (4%)	1074 (2%)	57647 (89%)	64728
12	32160 (51%)	31200 (49%)	900 (1%)	2218 (4%)	2387 (4%)	1100 (2%)	56755 (90%)	63360

3.5 shows the percentage of students in each region of the state by ethnic group. A large majority of black students, 68%, reside in the core cities. Fully one-fourth, however, attend suburban schools. A bare majority of Asian students, 52%, attend in the core cities, but one-third attend suburban schools, and 15% attend schools in outstate Minnesota. Most Hispanics (70%) attend outside the core cities, although a majority (57%) attend in the metropolitan area. Most American Indian students live outside the metropolitan area, with fully 40% attending in smaller districts outstate.

Figure 3.5 Percentage of Students in Each Ethnic Group, by Minnesota Region



School Characteristics

Do some schools produce a higher level of student achievement than other schools that serve similar students? This question has intrigued researchers,

policy makers, and practitioners for decades. It served as the driving force behind the initial school effects research in the 1960s. Pioneers in the effective schools research outlined several correlates that were associated with "effective" schools. These early findings were quickly embraced by American educators and soon found their way into school improvement programs across the United States.

By the mid-1980s, however, there was mounting evidence that much of the effective schools research suffered from methodological limitations. First, findings cannot be reduced to a formula for school improvement. Second, findings cannot always be generalized to all schools.

Nonetheless, school-based factors do have a major impact on student learning. Wang, Haertel, and Walberg (1993) summarized the results of their meta-analysis by rating the importance of 28 different factors that influenced student learning. The most influential factors, based on their mean effect, were classroom management, defined as increased student engagement, decreased disruptive behaviors, and quality of instructional time. Other influential factors included student-teacher interaction, quantity of instruction, school culture, classroom climate, curriculum design, and classroom assessment.

Data from other studies also confirm that school factors affect student achievement. Teddie and Stringfield (1993) conducted a study that found school, classroom, and teacher factors to account for 25 percent of the differences in student achievement. These findings are further supported by Zigarelli's (1996) empirical study, which tested the effect of each of the most commonly identified school effectiveness variables on student achievement. His analysis indicated that an achievement-oriented school culture, the principal's autonomy in hiring and firing teachers, and high teacher morale were the most important school characteristics associated with student achievement. These findings indicate that school factors

Table 3.4 1995-96 National Pupil-Teacher Ratios

Level[1]	Enrollment: Pre-K–12	Teachers (FTE)[2]	Pupil/Teacher Ratio
National Average	44,840,481	2,598,220	17.3
State Average			
Illinois	1,943,623	113,538	17.1
Indiana	977,263	55,821	17.5
Iowa	502,343	32,318	15.5
Kansas	463,008	30,729	15.1
Michigan	1,641,456	83,179	19.7
Minnesota	835,166	46,971	17.8
Missouri	889,881	57,951	15.4
Nebraska	289,744	20,028	14.5
N. Dakota	119,100	7,501	15.9
Ohio	1,836,015	107,347	17.1
S. Dakota	144,685	9,641	15
Wisconsin	870,175	55,033	15.8
Connecticut	517,935	36,070	14.4
Maine	213,569	15,392	13.9

[1] Snyder, T.D. (1997). *Digest of educational statistics (NCES 98-015).* Washington, DC: U.S. Dept. of Education, National Center for Education Statistics.

[2] FTE refers to "Full-time Equivalent."

can make a difference in student academic achievement.

Salient questions still need to be answered. In Minnesota, one of the most often discussed school-based factors is the ratio of teachers to students. Specifically, where should we focus our energies, and to what degree do these factors influence student achievement? To begin to answer these questions, we must examine our current understanding of class size and its effect on achievement, and then compare class size in Minnesota schools to class sizes in other states.

Class Size

The association between reduced class size and higher academic achievement is not as clear as the discussion sometimes suggests. For example, Glass and Smith's (1978) meta-analysis of research on the relationship of class size and student achievement found that while reduced class size can be expected to produce increased academic achievement, the major benefits from reduced class size are obtained *as class size is reduced below 20 pupils.* These findings, however, have been strongly criticized because of the seemingly arbitrary way in which studies were selected for analysis.

A compilation of studies examined by Robinson (1990) added an important set of qualifiers to the conclusions of Glass and Smith. Robinson stated that research does not support the expectation that smaller classes *alone* will result in greater academic gains for students. Rather, the effect of class size on student learning varies by: grade level (small classes are more effective in the primary grades); pupil characteristics, (for example, whether students are economically disadvantaged, from some ethnic minority, etc.); subject area (specifically, reading and mathematics in the primary grades); teaching methods; and other learning interventions. Unfortunately, this wide-ranging review failed to distinguish the best-designed studies from those using poor methodology, and therefore, the findings must be viewed as at least somewhat tentative.

The discussion surrounding class size and student achievement continues to provoke a great deal of interest. One theme that consistently presents itself is that lower class size alone seems unlikely to improve student achievement unless it is accompanied by improved classroom practices (Mueller, in press). A study conducted by Murnane and Levy (1996) highlights this point. In their study, not all schools that lowered class size succeeded in raising achievement. Those that succeeded viewed smaller class size as an enabling factor that allowed them to make major curricular and instructional changes. Combinations of changes, especially curriculum and instructional changes, are what teachers and administrators should focus on if they wish to max-imize the opportunities that smaller class sizes offer. Improved learning arises from the curriculum and instructional improvements that smaller class size *makes possible,* not from smaller classes *per se.*

The data represented in Tables 3.4 (page 18) and 3.5 (at left) are based on pupil/teacher ratios. Pupil/teacher ratio is not the same as class size, however. *Class size* is based on the actual number of students a teacher has in his/her class or classes. *Pupil/teacher ratio* is based on the total number of licensed teaching staff in a single school compared to the total number of pupils—whether all of these licensed staff are teaching classes, or detailed for other teaching-related tasks, such as curriculum development. Pupil/teacher ratios can often obscure the actual workload faced by a teacher. Class size—a more direct measure of classroom organization—is more important to academic achievement than pupil/teacher ratio (Boozer & Rouse, 1995). We are using pupil/teacher ratios in this report because class size information is lacking.

Table 3.5 1996-97 Minnesota Pupil-Teacher Ratios

Level	Enrollment K–12	Teachers (FTE)	Pupil/Teacher Ratio
State	827,490	48,168	17.2
Strata			
Mpls/St. Paul	92,723	5,463	17.0
Suburban	326,313	18,081	18.0
Outstate 2000+	201,555	11,668	17.3
Outstate 2000-	206,860	12,881	16.1
Metro Area vs. Outstate			
Metro Area	419,036	23,544	17.8
Outstate	408,415	24,548	16.6

The national pupil/teacher ratios in Table 3.4 (p. 18) are reported according to regions defined by the National Assessment of Educational Progress (NAEP). These regions include states that are clustered by a set of shared characteristics—region of the country, gender, race/ethnicity, parental education, type of school, and participation in federally funded Title I programs and the free/reduced-price lunch component of the National School Lunch Program. Maine and Connecticut, two states that have student achievement levels similar to Minnesota's, are also included.

Table 3.6 shows pupil/staff ratios. "Staff" refers to licensed school personnel, including administrators, counselors, teachers, media specialists, speech clinicians, psychologists, etc. Student/staff ratios are not clear indicators of student achievement because they cannot isolate single variables in the highly complex process of learning development. They do, however, tend to illuminate resource allocation decisions made by school districts (i.e., how much of each dollar goes for building improvement, staffing, and curriculum and instruction).

Table 3.6 1996-97 Minnesota Pupil-Staff Ratios

Level	Enrollment K–12	Licensed Staff (FTE)	Pupil/Staff Ratio
State	827,490	55,092	15.0
Strata			
Mpls/St. Paul	92,723	6,415	14.5
Suburban	326,313	20,695	15.8
Outstate: 2000+	201,555	13,303	15.2
Outstate: 2000-	206,860	14,679	14.1
Metro Area vs. Outstate			
Metro Area	419,036	27,110	15.5
Outstate	408,415	27,982	14.6

CHAPTER 4
PARTICIPATION: COURSEWORK, ATTENDANCE, AND GRADUATION

In this chapter, we have examined participation outcomes and indicators of student participation in education generally, or in particular educational programs. Are students in Minnesota high schools taking challenging coursework? What are the attendance patterns in Minnesota schools? What are the patterns that appear in Minnesota's graduation and dropout rates? This chapter addresses these questions, both for Minnesota students in general and for students in selected subgroups.

Secondary School Coursework

William Bennett (1988) states, in response to *A Nation at Risk*, "Common sense tells us, and education research confirms, that youngsters rarely learn what they do not study" (p. 23). Curriculum is important when addressing any educational enterprise. Patterns of high school coursework are interesting in their own right, but also for their relationship to other outcomes, such as later choice of college major (Jones, Bekhuis, & Davenport, 1985) and higher scores on college admissions tests (American College Testing Program, 1992, 1997). What do other states require of their students? What do our students study, and what variation is there across regions of the state and segments of our high school population? To partially address these questions, we consulted several sources, most of which focused on college preparatory courses.

MINNESOTA'S PROFILE OF LEARNING PERFORMANCE PACKAGES:

A SNAPSHOT FROM PELICAN RAPIDS, MINNESOTA

Learning Area: Arts and Literature

Crystal Thorson, an elementary art teacher from Viking Elementary School in Pelican Rapids, transforms her classroom into an "Art Museum." The art museum is based on 30 – 35 objects representing a variety of time periods, cultures, media, and artists. While in the art museum, students look for works that best match the art vocabulary studied in class. Students demonstrate their understanding by logging their findings on a scavenger hunt checklist. Students must find straight lines, geometric shapes, warm colors, and rough textures in the artwork. Once they have identified the elements, students attempt to draw them. Parent volunteers are on hand to assist.

When students have completed this task they select a favorite art object and do a more in-depth analysis. Students gather information about their favorite artwork using an Art Detective Notes record sheet. The following figure represents one student's information gathering notes.

(cont'd on p. 23)

State Course Requirements and National Recommendations

In their August 1998 report, the Council of Chief State School Officers (CCSSO, 1998) gave a comprehensive summary of course requirements necessary for high school graduation in all states and territories of the United States. Minnesota was listed as a "standards-based system," and had no statewide course requirements listed in any content area, although schools and districts do have requirements that vary by district. In place of course requirements at the state level, Minnesota has specified basic and high standards in its *Graduation Rule*, standards that every student is expected to meet.

Minnesota is one of a handful of states with no high school course graduation requirements at the state level and which leaves course requirements to districts. Most states have requirements in English (with most states requiring four years), mathematics (usually two or more years), social studies (usually three or more years), and science (usually 2 or more years). Some states have additional graduation requirements in the arts, foreign language, and computer technology. Table 4.1 (p. 22) shows the recommended course credit requirements in core academic areas recommended in *A Nation at Risk* (NCEE, 1983) and by the *ACT Assessment* program.

In contrast to most other states, Minnesota has expressed its statewide requirements, not in terms of courses taken, but in terms of what students should know and be able to do—the Graduation Standards. The *Basic*

Table 4.1 Recommended Course Credit Requirements

	Nation at Risk	ACT
Mathematics	3	3[1]
Science	3	3
English	4	4
Social Studies	3[2]	—
Social Sciences	—	3[2]
Foreign Language	2[3]	0
Computers	½	0[4]

[1] ACT makes more specific suggestions concerning which math courses to take.

[2] ACT suggests three credits in social science, which includes social studies. *A Nation at Risk* just recommends social studies.

[3] *A Nation at Risk* recommends foreign languages only for college-bound students.

[4] ACT places computer courses with mathematics.

National Commission on Excellence in Education (1983). *A nation at risk: The imperative for educational reform.* Washington, DC: Superintendant of Documents, U.S. Government Printing Office.

American College Testing Program (1997). *ACT high school profile report high school graduating class 1997: State composite for Minnesota.* Code 240-000, Iowa City, IA: Author.

Standards Tests and the performance packages associated with the *Preparatory* and *High Standards* give students the opportunity to demonstrate attainment of those standards.

ACT Core Course Preparation

As shown in Table 4.1 (above), the *ACT Assessment Program,* the major college admissions testing program in Minnesota, asks students to report on completion of core academic courses as they enroll to take the college entrance test. ACT has found that taking the recommended ACT core sequence is associated with higher scores on the admissions test. The recommended core sequence includes four years of English and three years each of science, social science, and mathematics. Figure 4.1 (below) shows the proportion of Minnesota test-takers completing the core over an eleven-year time span (*ACT Assessment Program,* 1992, 1997, 1998). From 1987-88 to 1997-98, the proportion of college-bound ACT test-takers completing a basic academic core has risen from 55% to 73%. This rise in preparation is extremely encouraging, but the distribution of that preparation over Minnesota's ethnic groups is not.

Figure 4.2 (p. 23) shows the percentage of 1997-98 Minnesota test-takers in each ethnic group who report having the core (*ACT Assessment Program,* 1998). Among presumably college bound students, there are marked differences across ethnic groups in the percentages of students

Figure 4.1 Percentage of Students Having Completed the ACT Recommended Core Academic Preparation for the Years 1987–98

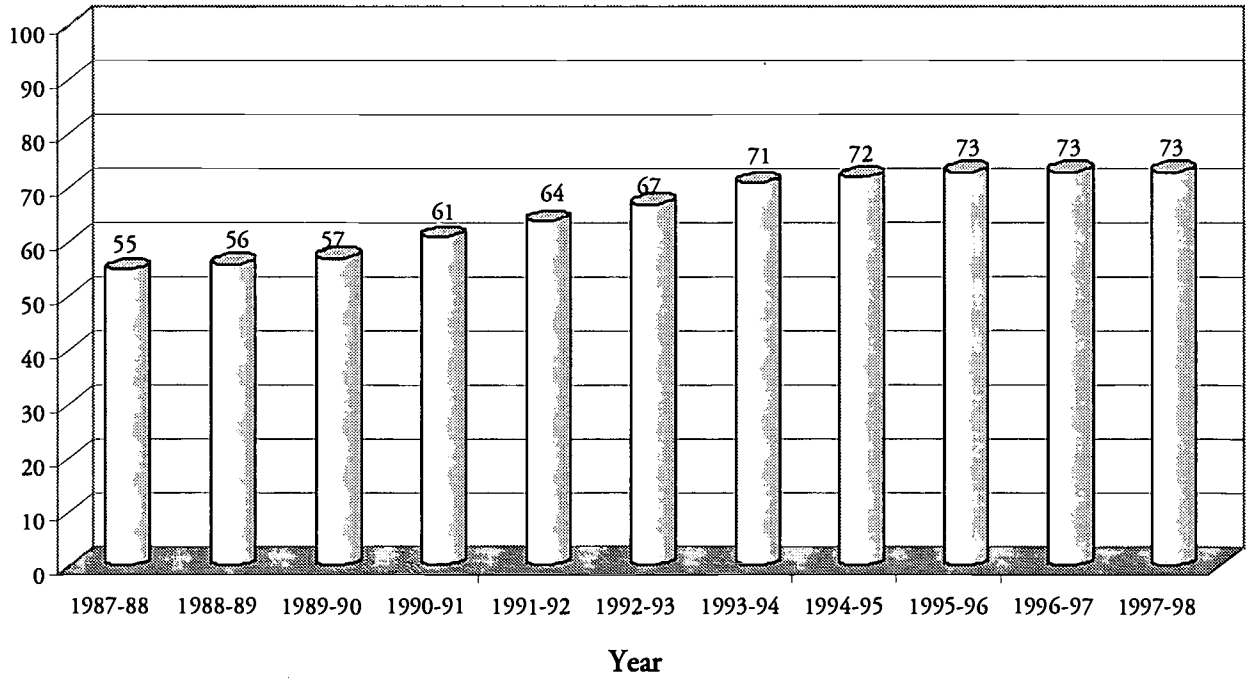
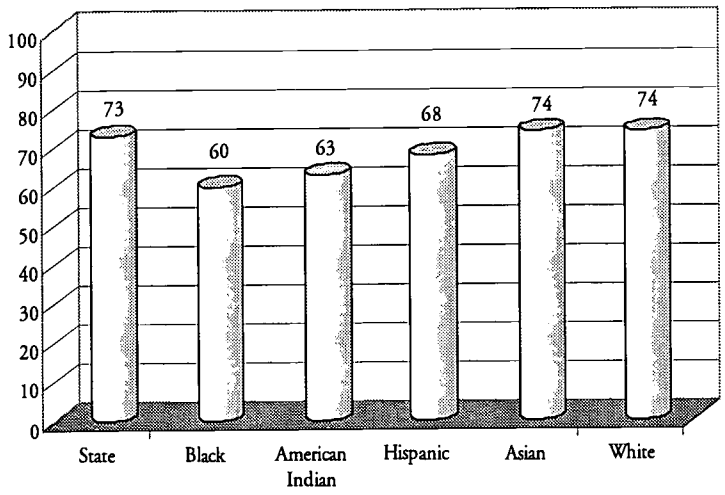


Figure 4.2 Percentage of Minnesota ACT Test-takers Having the Recommended Core Academic Preparation, by Ethnic Group (1997-98)



completing a basic academic core. Not only do these data raise serious questions about the equality of preparation for college across ethnic groups, they also raise doubts as to whether the preparation of some students is consistent with their future educational plans.

College-Level Coursework for High School Students

For Minnesota high school students, there is an array of three options within which a student can take advanced coursework for high school credit, and potentially, also for college credit: the *Advanced Placement* (AP) program, the *International Baccalaureate* (IB) program, and the *Post-secondary Enrollment Options* (PSEO) program. Advanced Placement and International Baccalaureate courses are taken at the high school; PSEO courses can be taken either at the high school or on the campus of a post-secondary institution.

Table 4.2 (p. 24) shows the growth of participation in AP programs. Since 1993, the number of participating schools has increased from 165 to 205. The number of students taking the exams has more than doubled from 4,438 to 9,369. The number of exams qualifying for a score of three or higher has increased over the period since 1991. The percentage of exams scored 3 or higher (qualifying for scholarship recognition and college credit on a scale of 1-5) hit a peak (66%) in 1994, dropped to 58% in 1995 and rose to 61% in 1997 (Minnesota Department of Children, Families, & Learning, 1998d). Undoubtedly, increased participation in AP programs has had some impact on overall test performance.

The number of schools and students participating in the International Baccalaureate program is smaller than for the AP program, just nine schools and 815 students in 1997. It too, however, is growing, and the percentage of exams achieving a score of 4 or better (qualifying for Honors status on a scale of 1–7) increased from 65% in 1996 to 71% in 1997.

(cont'd from p. 21)

ART DETECTIVE NOTES

Task 1

Directions: ***Choose your favorite artwork from the Museum. Write down information about it on the Museum label below.***

Title: **St Basil's Cathedral**

Artist: **Postnick and Barma**

Year or Time Period: **1555**

Medium: **stone**

Place created: **Russia**

What does this artwork tell you about the artist's time and place?

"old"
"far, far away"
"princesses might have lived in it"

What tools and materials did the artist use?

"stone"

What is the subject of this piece?

"a castle"

How does the artwork make you feel?

"wonderful"

(cont'd on p. 24)

In the case of both AP and IB programs, Minnesota post-secondary institutions award college credit to students who pass the various exams at certain levels (generally at a score of "3" for AP exams and "4" for IB tests). State funds also provide for scholarships to students who pass at these levels, for use in any Minnesota post-secondary institution.

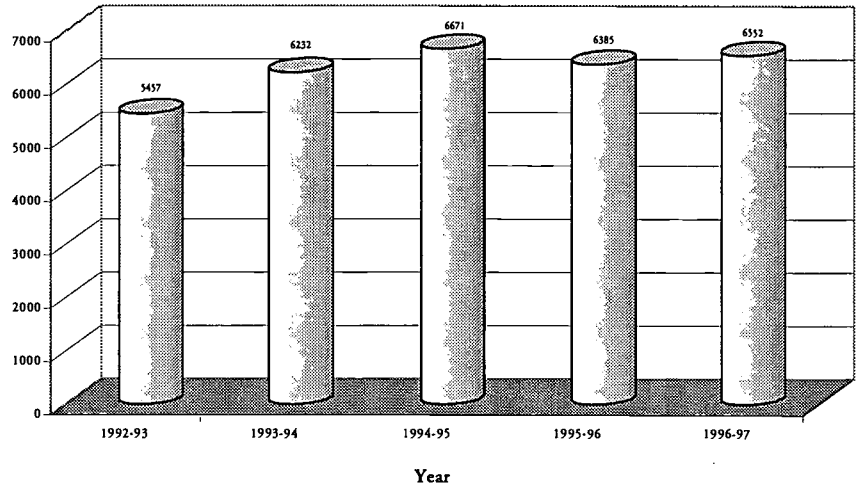
Participation in the PSEO program has generally increased over time (see Figure 4.3, at right). From 1992 to 1995, the number of students taking PSEO courses on post-secondary campuses steadily increased from 5,457 to 6,671. After a slight decrease during the 1995-96 school year, the numbers again increased during the 1996-97 school year to 6,552 students. The decline in 1995–96 reflects the fact that students are increasingly taking PSEO courses at their own high school, rather than on post-secondary campuses. At present, more than half of all PSEO courses are taken at high schools as part of a

Table 4.2 Growth in the Advanced Placement Program

	1993	1994	1995	1996	1997
Schools	165	167	193	201	205
Candidates	4,438	4,890	7,278	8,465	9,369
Exams	5,794	6,491	9,401	11,169	12,641
Exams/Candidates	1.306	1.327	1.292	1.319	1.349

Minnesota Department of Children, Families, and Learning (1998). *Advanced Placement and International Baccalaureate Programs.* St. Paul: Author.

Figure 4.3 Number of Students Participating in Post Secondary Enrollment Options *Programs on Post-secondary Campuses for the years 1992–97*



(cont'd from p. 23)

ARTS AND LITERATURE
Task 2

The second task requires communicating ideas using visual arts. Crystal facilitates this process by introducing Faith Ringgold's "Narrative Story Quilt" artworks. After learning about the Story Quilts, students develop an idea for a story, using their favorite artwork as a springboard. Once the story has been formulated, students begin preliminary drawings which tell their story without words.

Before students complete their Story Quilt, they are taught a variety of art processes (printmaking, design & layout, mixed media techniques, etc.) to incorporate into their final Story Quilt.

The Story Quilts measure at least 18 by 18 inches. Each quilt has a border made of relief prints which include elements from their favorite artwork. Students create the design, choose the colors, and determine what other media (foil paper, origami paper, wallpaper, craft paper, magazine paper, etc.) that they will use to depict their story.

The students are evaluated on the performance tasks using a feedback checklist. The scores consist of Y (yes, the student has met the performance requirement) or N (no, the student has not met the performance requirement). Crystal uses the checklists to monitor student progress on the standard. Once students complete all the performance tasks, Crystal will assign the students a score for the standard taking into account their previous performance. Below is a partial feedback checklist for Task 1.

To help parents understand the new graduation requirements, Crystal set up an exhibit of student Story Quilts. The exhibit was used to guide parents through the tasks in the performance package. Crystal sees the graduation standards making the classroom more student centered, with a much stronger emphasis on individual student achievement. Although the paperwork associated with the performances has been burdensome, Crystal says she now knows her students better.

Partial Feedback Checklist: Task 1

Y = YES, MET PERFORMANCE STD. N= NO, DID NOT MEET PERFORMANCE STD.

	Teacher Evaluation
Makes logical observations about the artist's time and place from the artwork	_____
Identifies tools and materials that would logically have been used by the artist	_____
Describes feelings related to the artwork clearly	_____
Uses art terms correctly to answer questions	_____
Identifies strong examples of each art element in chosen artwork (line, shape, color, texture)	_____

Table 4.3 Percentage of Students in Attendance for Third, Fifth, Eighth, and Twelfth Grades

	Grade			
	Third	Fifth	Eighth	Twelfth
Total	95	95	94	92
Girls	95	95	93	92
Boys	95	95	94	93
Asian	97	97	94	92
Black	94	94	90	88
Hispanic	93	93	89	87
American Indian	92	92	86	84
White	95	95	94	93
Special Education	95	94	91	90
Limited English	96	96	92	91
Metro Area	94	94	93	92
Outstate	96	96	95	93
Mpls./St. Paul	94	94	90	89
TC Suburbs	94	95	93	92
Outstate 2000	96	96	94	92
Outstate 2000	96	96	95	93
Public/Not Charter	95	95	94	92
Public/Charter	94	94	91	79

Data Sources: For third, fifth, and eighth grades, attendance was calculated using all students in 1998. Twelfth grade attendance was calculated from the 1997 completion study file of the Minnesota Department of Children, Families, and Learning.

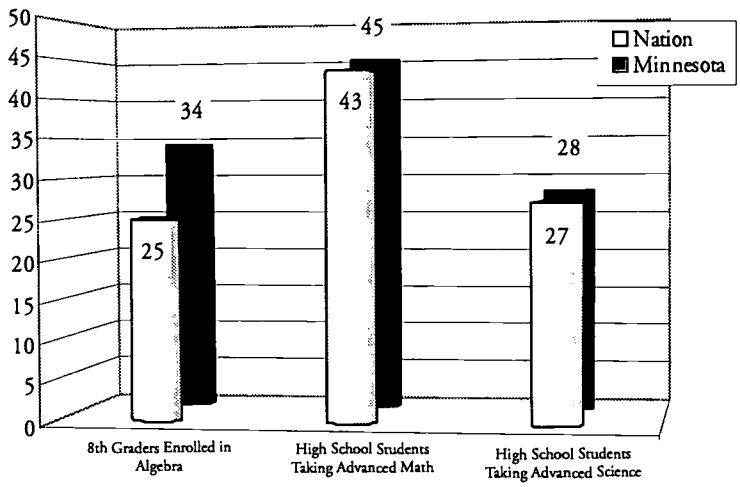
cooperative effort between the high school and a post-secondary institution. Social studies and language arts courses are most popular. Selections also include vocational/technical, math, science, foreign language, business, and health courses. Increasingly, high school students can elect to take college level work in Advanced Placement, International Baccalaureate, and PSEO programs, and they have been choosing to do so in growing numbers.

Another coursework indicator monitored on the national level is the percentage of eighth graders taking algebra (see Figure 4.4). In 1996, 34% of Minnesota eighth graders enrolled in algebra, as compared to 25% nationally (Shaughnessy, Nelson, & Norris, 1998). Only four states (Utah, Maryland, Massachusetts, and Delaware) enrolled a higher percentage of eighth graders in algebra. Hence, Minnesota's enrollment compares favorably to that in most other states.

Finally, the participation of high school students (grades 9 - 12) in advanced high school mathematics (defined as geometry, algebra 2, trigonometry, or calculus) and science courses (defined as chemistry, physics, or advanced or second-year science courses) is also monitored at the national level. In the latest year for which we found data, 1996 (Editorial Projects in Education, Inc., 1998), 45% of Minnesota high school students were reported as taking advanced math (Figure 4.4). Fifteen states reported more students doing so (including Illinois, Massachusetts, Nebraska, North Carolina, North

Increasingly, high school students can elect to take college level work in Advanced Placement, International Baccalaureate, and Post-secondary Options programs, and they have been choosing to do so in growing numbers.

Figure 4.4 Percentage of Eighth Grade Students Taking Algebra and High School Students Taking Advanced Mathematics and Science



Dakota, Pennsylvania, South Dakota, Utah, West Virginia, and Wisconsin, all of whom reported more than 50% of their students taking upper-level mathematics). Sixteen states reported more students in advanced science (including Connecticut, Illinois, Kentucky, Massachusetts, Mississippi, Nebraska, North Dakota, Pennsylvania, Utah, West Virginia, and Wisconsin, all of whom report more than 30% as taking advanced science). In Minnesota, 28% were reported as doing so (see Figure 4.4, p. 25).

ATTENDANCE

One of the strongest foundations for school success is regular school attendance. During the 1997 fiscal year, the Minnesota Office of the Legislative Auditor performed an analysis of the *Basic Standards Test* scores in reading and mathematics (1998). Of the variables analyzed, attendance had the strongest relationship with average school test scores.

Table 4.3 (p. 25) shows the percentage of students in attendance at each of four grade levels. At grades three and five, the Minnesota average is 95%. At grade eight, it is 94%, and decreases to 92% by twelfth grade. Girls and boys have identical attendance rates at third and fifth grade, and there is only a one-percent difference at the eighth and twelfth grades.

Differences among ethnic groups are small in third and fifth grades but become more marked in the secondary grades. Asians have the highest attendance rates of any ethnic group in third and fifth grades (97%); in eighth and twelfth grades, they have the same attendance rate as the state overall (94% for eighth grade; 92% for twelfth grade). From 95% in third grade to 93% in twelfth grade, white students' attendance rates change very little as students get older. Rates for black students drop six percentage points between third and twelfth grades, from 94% to 88%. Attendance rates for Hispanic students also fall 6% between third and twelfth grades, from 93% to 87%. American Indian students begin from the lowest attendance rate, 92% in third grade, and suffer the largest decline, 8%, by twelfth grade.

Students receiving special education and students with limited English proficiency have rates within 1% of the state as a whole at the third and fifth grade levels. These special populations experience a decline in attendance from the fifth to the eighth grades. By twelfth grade, their attendance rates are 90% for Special Education students and 91% for limited English proficiency students, 1 – 2% below those of the state as a whole.

When categorizing the state's districts into four groups—Minneapolis/St. Paul, the Twin Cities suburbs, large outstate districts (more than 2000 students), and small outstate districts (less than 2000 students), attendance rate declines are sharpest in the two core cities. Across these four regions, rates differ by at most 2% in third grade. By twelfth grade, however, there is a 4% difference between the Twin Cities and the small outstate districts.

Attendance rates for charter schools were also calculated. In third and fifth grades, the attendance rates for charter schools were one percent below that of other public schools (94% versus 95%). The charter school attendance rate declines 3% between fifth and eighth grades to 91%. The twelfth grade attendance rate is only 79%, although it is based on a very small number of twelfth grade charter school

Table 4.4 Four Year Graduation and Dropout Rates

Category	Number of Students	Number of Graduates	Number of Dropouts	Number Continuing	4-year Graduation Rate (%)	Dropout Rate (%)
Total	59699	46680	6758	6261	78	11
Girls	29298	23870	2801	2627	81	10
Boys	30401	22810	3957	3634	75	13
Asian	1784	1216	317	251	68	18
Black	2506	891	998	617	36	40
Hispanic	993	434	373	186	44	38
American Indian	1089	447	413	229	41	38
White	53327	43692	4657	4978	82	9
LEP	571	285	193	93	50	34
Special Ed.	5830	3403	1180	1247	58	20
Metro Area	26581	20138	3769	2674	76	14
Outstate	30583	26109	2297	2177	85	7
Mpls./St. Paul	5759	2704	2050	1005	47	36
TC Suburbs	20822	17434	1719	1669	84	8
Outstate:2000+	15215	12083	1516	1616	79	10
Outstate:2000-	15368	14026	781	561	91	5
Public/Charter	149	37	54	58	25	36
Public/Non-Charter	59550	46643	6704	6203	78	11

students in the 1997 high school completion study (Minnesota Department of Children, Families, and Learning, 1998b).

Educational researchers have long studied the association between attendance and leaving high school ("dropping out"). Poor attendance often precedes dropping out. Indeed, the decline in attendance from fifth to twelfth grade, as shown in Table 4.3 (p. 25), may begin to reflect the

PROFILE OF LEARNING PERFORMANCE PACKAGE: A SNAPSHOT FROM CANNON FALLS, MINNESOTA

LEARNING AREA: DECISION MAKING

Mr. Lindow and his fellow teachers in Cannon Falls have teamed up to deliver the decision-making standard in 6th, 7th, and 8th grade using a modified version of the performance package, "Understanding Career Options."

In sixth grade, students take an interest and ability survey. Teachers guide students through the use of the self-assessment survey and the interpretation of the results. Teachers discuss the findings with their students, helping them to see connections among interest, ability, and career choices.

In seventh grade, students take part in another interest survey. Using the results of this survey and last year's survey, students select two possible career options to pursue in more depth. Seventh grade teachers build in class time that allows students to gather information on one of their career choices. Students typically use the media center to begin their information search. Books, periodicals, the Internet, and CD-ROMs make up a portion of the resources that students use in the development of their career file.

The next stage involves a real-life experience. Students spend a half-day working with (shadowing) a person in their preferred profession. According to Mr. Lindow, "This real-life context is a critical element in understanding what the career is all about. It also serves as a reference in their career portfolio."

After completing the shadowing experience, students put together a presentation for the class. The presentation will include current, accurate information about the student's career option. It will identify the specific skills and abilities needed to do the job, and it should contain information regarding the preparation for the career (e.g. education and training). Students may present this information to the class in a variety of formats: speeches, workshops, brochures, power point presentations, videotaped productions, etc.

One student created a poster that outlined the specific skills and abilities of a retail sales clerk in her local community. The following are excerpts from her report:

RETAIL SALES CLERK

Skills and Abilities:

A retail sales person has several responsibilities. First, they need to be knowledgeable about the cash register and the cost of items in the store. Second, they must work hard to keep the store clean and orderly. Third, they need to be upbeat and friendly because over half the job is working with customers.

Education and Training:

Most employers will hire high school graduates, but the more education and training a person has the better his/her chances of getting a job.

Helpful subjects to take in school are math and English. A cashier's training course and/or computer skills would also be helpful.

Retail sales people should be in good health. Sales people are often on their feet all day and tend to do a lot of lifting.

Technology Used in the Business:

A cash register and calculator are the main items of technology that this retail business uses. A filing system keeps track of inventory.

I think a computer would be a good addition to the store. It would help keep things more organized.

Mr. Lindow stated that the students have responded positively to the performance package and the shadowing experience. And, although the middle level teachers at Cannon Falls have been doing a careers unit for some time, Mr. Lindow said the standard and performance package have given them a stronger focus and a common language.

The final portion of the Understanding Career Options performance package is completed in eighth grade. Students refer back to their career file and explore their other career option. This exploration is mainly conducted on the students' own time. Their findings may again be presented in a variety of formats: written, oral, audio, video, workshop, etc. An interesting question that students must address in their essay is the impact their career might have on personal, family, and community life.

The score a student receives for the Decision Making standard is determined by taking into account the level of achievement attained by the student on all the performance tasks described in the package. The overall scoring criteria for the standard consists of a four-point scale with the following values:

4 – *Exemplary:* Indicates evidence of student learning in all parts of the standard at a level that exceeds expectations by using and applying knowledge consistently, in new and insightful ways.

3 – *Proficient:* Indicates evidence of student learning in all parts of the standard at a consistently proficient level.

2 – *Novice:* Indicates evidence of student learning in all parts of the standard at an adequate level some or all of the time.

1 – *Emerging:* Indicates evidence of student learning in all parts of the standard at a superficial level some or all of the time.

declining attendance of some students that precedes dropping out. Stemming the decline in attendance during the secondary grades may be essential to cutting the dropout rate covered in the next section.

Dropout Rates

Table 4.4 (p. 26) shows the four-year graduation rate and the dropout rate for the state as a whole and for various groups and regions around the state. These estimates come from a four-year longitudinal study of students who were ninth graders in 1994, excluding students who transferred out of state or to a non-public school. For the state as a whole, 78% of the 1994 ninth graders in the study graduated from a Minnesota high school four years later. Eleven percent left high school. Somewhat surprisingly to us, fully 11% were still enrolled in high school but had not yet completed work for their diploma. This four-year high school completion rate, 78%, may not be comparable to that from other states, who include all students receiving a high school diploma, not just those finishing in four years. Census studies include, not only those graduating in more than four years, but also those who receive a high school equivalency degree.

Boys have a lower graduation rate (75% vs. 81%) and a higher dropout rate (13% vs. 10%) than girls. Among the ethnic groups, Whites have the highest graduation rate (82%), followed by Asian students (68%), Hispanic (44%), American Indian (41%), and Black students (36%). Completion rates vary widely across the different regions of the state, from 47% in the two urban cities to a commendable 91% among the small outstate districts.

For the state as a whole, 78% of the 1994 ninth graders in the study graduated from a Minnesota high school four years later. Eleven percent left high school, and another 11% were still enrolled in high school but had not yet completed work for their diploma.

Dropout and graduation rates among blacks pose a paradox in light of educational attainment figures reported by the Census Bureau. The low completion rate and high dropout rate in Table 4.4 seemingly run contrary to national reports, which suggest that the high school graduation rates for black and white students are equalizing (News America Digital Publishing/Fox News Online, 1998). The Census Bureau counts an individual as having a high school education if they have a high school diploma or an equivalency degree, and its surveys cover adults 25 years and older. In the last full census year, 1990, the Census Bureau reported that 76% of blacks and 82% of all Minnesotans aged 25 and over had attained a high school education, either a high school diploma or an equivalency degree (Snyder, 1997). More recently, in their 1997 educational attainment study, the Census Bureau (1998) estimated that the percentage of blacks with a high school education was as high as that for the state as a whole.

In this regard, fully 24% of black students have neither graduated nor dropped out, but are continuing their education after the end of the four years covered by the study (see Table 4.4). Because the data in Table 4.4 are limited to the four years following ninth grade and to the standard K–12 educational programs, the completion rates and dropout rates shown in the table may incompletely describe the high school educational attainment of black Minnesotans. The Census data suggest that many black Minnesotans may attain a high school education after the traditional four years and/or outside a conventional K-12 degree program.

CHAPTER 5
ACHIEVEMENT

INTRODUCTION

Increasingly, the proof of success in Minnesota's K-12 educational system is framed in terms of student outcomes, particularly through various assessments designed to evaluate the extent to which our students are successfully learning and meeting our high academic expectations.

In this chapter, we begin by benchmarking the achievement of Minnesota students against that of students from other countries using data from international studies in reading, mathematics, and science. Then we turn our attention toward the most recent results from our nation's "Report Card," the *National Assessment of Educational Progress (NAEP)*. These data allow us to benchmark the achievement of Minnesota students against that of other states in the U.S. Next, we turn to a more detailed examination of achievement within the state using Minnesota's statewide tests: the *Minnesota Comprehensive Assessment (MCA)* in third and fifth grades and the *Basic Standards Tests (BST)* in eighth grade. Finally, we examine the performance of college-bound students as reflected in the college admissions test most frequently taken by high school students in Minnesota, the *ACT Assessment* (*ACT*).

COMPARING THE ACHIEVEMENT OF MINNESOTA STUDENTS TO OTHER NATIONS

Many significant challenges present themselves when comparing Minnesota students' performance to that of other countries. National differences in curricular content, instructional approaches, language, and school organization make it difficult to design achievement measures that are truly comparable across countries. Of the subjects reviewed here—reading, mathematics, and science—reading poses the greatest challenges. Students from the differing countries are learning to read different languages spelled with varying alphabets or symbol systems. In the grades and subject areas where data are available, we try to answer the question, "How does the achievement of students in Minnesota compare to that of students in other countries?"

READING ACHIEVEMENT AMONG NATIONS

Starting in 1989, the United States participated along with 31 other nations in the International Reading Literacy Study sponsored by the International Association for the Evaluation of Educational Achievement (IEA), an independent international cooperative of research centers and departments of education in more than 50 countries. In the United States, data were collected on approximately 7,200 students in the fourth grade and 3,800 students in the ninth grade at 332 public and private schools. The sample included schools distributed in 227 school districts across 31 states and the District of Columbia.

Generally speaking, American fourth grade students per-

MINNESOTA COMPREHENSIVE ASSESSMENTS

The newest statewide tests in Minnesota are the *Minnesota Comprehensive Assessments* (MCAs). Their content is based on the *Preparatory Standards* in the Graduation Rule.

At third grade, students are tested in reading and mathematics. At fifth grade, they take tests in reading, mathematics, and writing. For both grade levels, the reading and mathematics tests include a combination of multiple choice and open-ended items. For the writing portion, students must prepare a short composition.

The tests are scored using four possible proficiency levels:

- **Level I: Students demonstrate little or no evidence of the knowledge and skills required for satisfactory work in the subject area.**
- **Level II: Students demonstrate partial evidence of the knowledge and skills necessary for satisfactory work in the subject area.**
- **Level III: Students demonstrate evidence of solid academic performance and competence in the knowledge and skills of the subject.**
- **Level IV: Students demonstrate superior performance in the subject area, beyond what is expected.**

By demonstrating solid academic performance on the *Preparatory Standards*, students at Level III or above have demonstrated more than simple minimum competency. There is reason for concern about the performance of students at Level I.

In addition to a level, students are given a scale score whose statewide mean varies by subject area, but which stays at approximately 1400 for all students statewide.

formed extremely well. Only Finland outperformed American fourth graders (U.S. Department of Education, 1996). The fourth grade total reading achievement score for American students (547) was statistically lower than Finland (569), statistically equal to the achievement of Swedish children, and statistically higher than the remaining 24 nations participating in this portion of the study (see Table 5.1).

The ninth grade reading total achievement score for U.S. students was 535, which was essentially equal to the scores of 15 other countries. Once again, American students were significantly lower than only one country (Finland, whose students scored 560), and statistically higher than 14 nations (see Table 5.2).

Drawing Conclusions from the IEA Study for Minnesota Students

The IEA International Reading Literacy Study did not allow for the reporting of scores at the individual state level; consequently we cannot directly say anything about the performance of Minnesota students in fourth and ninth grade as compared to those of students in other

Table 5.1 IEA Fourth Grade Reading Achievement: Average Scores

Nations with Average Scores Significantly Higher than United States		Nations with Average Scores Not Significantly Different from United States		Nations with Average Scores Significantly Lower than United States	
Finland	569	United States	547	France	531
		Sweden	539	Italy	529
				New Zealand	528
				Norway	524
				Iceland	518
				Hong Kong	517
				Singapore	515
				Switzerland	511
				Ireland	509
				Belgium - French	507
				Greece	504
				Spain	504
				Germany (West)	503
				Canada (B. Columbia)	500
				Germany (East)	499
				Hungary	499
				Slovenia	498
				Netherlands	485
				Cyprus	481
				Portugal	478
				Denmark	475
				Trinidad/Tobago	451
				Indonesia	394
				Venezuela	383

Table 5.2 IEA Ninth Grade Reading Achievement: Average Scores

Nations with Average Scores Significantly Higher than United States		Nations with Average Scores Not Significantly Different from United States		Nations with Average Scores Significantly Lower than United States	
Finland	560	France	549	Norway	516
		Sweden	546	Italy	515
		New Zealand	545	Ireland	511
		Hungary	536	Greece	509
		Iceland	536	Cyprus	497
		Switzerland	536	Spain	490
		Hong Kong	535	Belgium - French	481
		United States	535	Trinidad/Tobago	479
		Singapore	534	Thailand	477
		Slovenia	532	Philippines	430
		Germany (East)	526	Venezuela	417
		Denmark	525	Nigeria	401
		Portugal	523	Zimbabwe	372
		Canada (B. Columbia)	522	Botswana	330
		Germany (West)	522		
		Netherlands	514		

Despite the decline in scores from 1992 to 1994, only Maine's students clearly outscored Minnesota students, and the reading achievement of our fourth graders remains near the top nationally. Since American fourth graders' average scores on the IEA study were exceeded by only one country, we can be relatively sure that Minnesota students' performance in reading, at least at the fourth grade level, would be very competitive internationally.

countries. But, as we shall see later, the results of this country's National Assessment of Educational Progress (NAEP) in fourth grade reading show Minnesota fourth graders' performance to be well above the national norm. Minnesota fourth graders score well above the United States average on NAEP, and the United States average in the IEA study is significantly exceeded by that of only one country. Therefore, we can be relatively sure that Minnesota students' performance would be competitive with those students from even the best countries participating in the IEA study, at least at the fourth grade level.

Table 5.3 Minnesota Fourth Grade Mathematics Performance in TIMSS, Compared to the U.S. and Other Nations

Nations with Average Scores Significantly Higher than Minnesota		Nations with Average Scores Not Significantly Different from Minnesota		Nations with Average Scores Significantly Lower than Minnesota	
Singapore	625	Austria	559	Scotland	520
Korea	611	Slovenia	552	England	513
Japan	597	Ireland	550	Cyprus	502
Hong Kong	587	Hungary	548	Norway	502
Netherlands	577	Australia	546	New Zealand	499
Czech Republic	567	United States	545	Greece	492
		Minnesota	542	Thailand	490
		Canada	532	Portugal	475
		Israel	531	Iceland	474
		International Avg	529	Iran, Islamic Rep	429
		Latvia (LSS)	525	Kuwait	400

International Mathematics Achievement

The *Third International Mathematics and Science Study (TIMSS),* also coordinated by IEA, is the largest comparative assessment study of mathematics and science education to date. Forty-five nations participated in the various components of TIMSS, which included student assessments, a curriculum content analysis, and questionnaires for both students and teachers. During the academic year of 1994-95, approximately 34,000 American students in grades 3-4, 7-8 and 12 participated. Additionally, SciMath^{MN} (a state partnership of Minnesota business, education, and government pursuing statewide improvement in the teaching and learning of K-12 mathematics and science) sponsored nearly 5,000 Minnesota students to participate as a "mini-nation." Mini-nation status makes it possible to compare Minnesota results with the U.S. as a whole, and with other countries in the study.

Table 5.4 Minnesota Eighth Grade Mathematics Performance in TIMSS, Compared to the U.S. and Other Nations

Nations with Average Scores Significantly Higher than Minnesota		Nations with Average Scores Not Significantly Different from Minnesota		Nations with Average Scores Significantly Lower than Minnesota	
Singapore	643	Slovak Republic	547	Latvia	493
Korea	607	Switzerland	545	Spain	487
Japan	605	Netherlands	541	Iceland	487
Hong Kong	588	Slovenia	541	Greece	484
Belgium-Flemish	565	Bulgaria	522	Romania	482
Czech Republic	564	Austria	539	Lithuania	477
		France	538	Cyprus	474
		Hungary	537	Portugal	454
		Russian Federation	535	Iran, Islamic Rep	428
		Australia	530	Kuwait	392
		Ireland	527	Colombia	385
		Canada	527	South Africa	354
		Belgium-French	526		
		Minnesota	525		
		Sweden	519		
		Thailand	522		
		Israel	522		
		International Avg	513		
		Germany	509		
		New Zealand	508		
		England	506		
		Norway	503		
		Denmark	502		
		United States	500		
		Scotland	498		

Fourth Grade International Math Performance

To date, SciMath^{MN} has analyzed Minnesota fourth and eighth grade mathematics and science results. In mathematics, Minnesota fourth graders scored above the international average (529) of the 26 participating countries. Minnesota's average mathematics performance (542) was not statistically different from the U.S. (545) as a whole (Table 5.3, above). The Minnesota average score was lower than six nations, statistically equal to nine nations including the United States, and significantly higher than eleven other countries.

In the various content areas covered by the TIMSS math assessment, Minnesota fourth graders exceeded the international average in four of the six areas tested: (1) whole numbers; (2) data representation, analysis, and probability; (3) geometry; and (4) patterns, relations, and functions. In the other two areas (fractions and

proportionality; and measurement, estimation, and number sense), the Minnesota fourth grade average was lower than the international average (SciMath^{MN}, 1998).

Eighth Grade International Math Performance

Minnesota eighth graders participating in TIMSS averaged a score of 525, above both the international average (513) and the U.S. average (500). They scored statistically lower than 6 nations, about the same as 23 nations and statistically higher than 12 nations (see Table 5.4, p. 31).

Minnesota eighth graders scored higher than the U.S. and international averages in the content areas of fractions and number sense; proportionality; algebra; and data representations, analysis, and probability. Our eighth graders scored lower than the international average, but above the U.S. average in the content areas of measurement and geometry. Minnesota was in the middle category of performance for all content areas.

Drawing Conclusions from the TIMSS Math Assessment for Minnesota Students

Based on our performance in the TIMSS mathematics assessment and an analysis of our curriculum, SciMath^{MN} (1997) recommends a number of curricular changes (e.g., that algebra and geometry become part of our standards for eighth grade mathematics). A re-analysis of our mathematics curriculum seems warranted, particularly in seventh and eighth grades.

International Science Achievement

Fourth Grade International Science Performance

The average Minnesota fourth grade score of 577 was well above the international average (524) of the 26 participating countries in the TIMSS science assessment. Minnesota's average score was above, but not statistically different from, the U.S. average (565) as a whole. Only one country was statistically higher than Minnesota, Korea (597); four nations were statistically equivalent to Minnesota; and 21 nations were statistically lower than Minnesota (see Table 5.5). In the four content areas covered by the TIMSS science assessment, Minnesota fourth graders exceeded the international average in each area, as did the U.S. as a whole. In three of these areas—earth science, life science, and environmental issues/nature of science—Minnesota fourth-graders were among the top group of countries (SciMath^{MN}, 1998).

Eighth Grade International Science Performance

Minnesota eighth graders' overall scale score in science performance (565) was significantly above the U.S. (534) and international averages (516). Only eighth grade students in Singapore (607) significantly outscored Minnesota students in the TIMSS science assessment. Fourteen countries' scores were not significantly different from Minnesota; and Minnesota was statistically higher than 26 countries, including the United States, and statistically higher than the international average (see Table 5.6, p. 33). The TIMSS science scores show the power of instructional alignment with Minnesota's science curriculum. In the five eighth grade science content areas (earth science, life science, chemistry, physics, and environmental science), Minnesota eighth graders exceeded the international and the national average in every area, and in two of these Minnesota students scored among the highest performing groups.

Drawing Conclusions from the TIMSS Science Assessment for Minnesota Students

Minnesota's methods for teaching elementary science are reflected in our

Table 5.5 Minnesota Fourth Grade Science Performance in TIMSS, Compared to the U.S. and Other Nations

Nations with Average Scores Significantly Higher than Minnesota		Nations with Average Scores Not Significantly Different from Minnesota		Nations with Average Scores Significantly Lower than Minnesota	
Korea	597	Minnesota	577	Netherlands	557
		Japan	574	Czech Republic	557
		United States	565	England	551
		Austria	565	Canada	549
		Australia	562	Singapore	547
				Slovenia	546
				Ireland	539
				Scotland	536
				Hong Kong	533
				Hungary	532
				New Zealand	531
				Norway	530
				International Avg	524
				Latvia (LSS)	512
				Israel	505
				Iceland	505
				Greece	497
				Portugal	480
				Cyprus	475
				Thailand	473
				Iran, Islamic Rep	416
				Kuwait	401

Table 5.6 Minnesota Eighth Grade Science Performance in TIMSS, Compared to the U.S. and Other Nations

Nations with Average Scores Significantly Higher than Minnesota		Nations with Average Scores Not Significantly Different from Minnesota		Nations with Average Scores Significantly Lower than Minnesota	
Singapore	607	Czech Republic	574	Sweden	535
		Japan	571	United States	534
		Korea	565	Germany	531
		Bulgaria	565	Canada	531
		Minnesota	565	Norway	527
		Netherlands	560	New Zealand	525
		Slovenia	560	Thailand	525
		Austria	558	Israel	524
		Hungary	554	Hong Kong	522
		England	552	Switzerland	522
		Belgium-Flemish	550	Scotland	517
		Australia	545	Spain	517
		Slovak Republic	544	International Avg	516
		Russian Federation	538	France	498
		Ireland	538	Greece	497
				Ireland	494
				Romania	486
				Latvia (LSS)	485
				Portugal	480
				Denmark	478
				Lithuania	476
				Belgium-French	471
				Iran, Islamic Rep	470
				Cyprus	463
				Kuwait	430
				Colombia	411
				South Africa	326

overall outstanding performance in the TIMSS science assessment. The traditional Minnesota elementary science program uses a hands-on structure to emphasize the children's natural curiosity both inside and outside the classroom. Our state's traditional approach to teaching science emphasizes a considerable amount of class discussion and laboratory work, which may help explain the relatively strong performance of Minnesota students in science (SciMath^{MN}, 1998).

Comparing the Achievement of Minnesota Students to The Nation

The *National Assessment of Educational Progress* (NAEP) is the major system of measurement designed to give a picture of student achievement across the United States. Often referred to as "The Nation's Report Card," it tests a stratified random sample of students at the fourth, eighth and twelfth grades in several subjects to measure performance for the nation at each grade. In addition to these measures, state-by-state comparisons are reported for reading, mathematics, and science at the fourth and/or eighth grade levels. This section examines the performance of Minnesota fourth and eighth graders in these three content areas, in comparison to their peers nationally.

NAEP uses three performance levels to describe a student's mastery of the subjects being tested: Basic, Proficient, and Advanced. The Proficient Level (the one used in this section to benchmark Minnesota students' performance) is described as representing "solid academic performance." Students reaching this level have "demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real world situations, and analytical skills appropriate to the subject matter" (Shaughnessy, C. A., Nelson, J. E., & Norris, N. A., 1998, p. 40).

The interpretation of NAEP proficiency levels has some of the ambiguity associated with letter grades in school. As parents, we would like our children to get "A's" and "B's" on their report cards, but we know that it would be unrealistically demanding to expect *all* of our children to get "A's" in *every* subject *every* year. Similarly, we would like all of our children to score at or above the "Proficient" level in the NAEP system, but at the same time we know how unrealistic and demanding that would be. Rather than expecting all children in Minnesota to score at or above the Proficient level, we compare the percentage of children in Minnesota who reach that level to the percentage in other states as a way to benchmark achievement in Minnesota against that in other states. In short, "How does the performance of students in Minnesota compare to that of students in other states?"

Fourth Grade Reading Achievement

Figure 5.1 (p. 34) displays the results of the NAEP Reading "Report Card" for fourth graders in both 1992 and 1994, the most recent years for which such data are available. As a whole, the performance of Minnesota fourth graders surpassed the national average in both years. However, when we consider student reading performance over time, Figure 5.1 shows Minnesota's fourth grade reading performance *declining* slightly during this two-year period. By 1994, Minnesota ranked 14th among the participating states in its overall mean scale score of 218, although differences between our average and those of the higher ranked states were not statistically significant (with the exception of Maine and its mean scale score of 228). This decline of scores between

1992 and 1994 reflected a national trend.

Using the percentage of students achieving at the Proficient Level, Figure 5.2 reveals the performance of selected subgroups in the NAEP 1994 Reading Assessment in both Minnesota and the nation as a whole. Overall, a greater percentage of Minnesota fourth graders achieved proficiency than fourth graders nationally. However, when gender and ethnicity are taken into account, scores from the various subgroupings are all statistically similar to their national counterparts.

Figure 5.1 1992-94 NAEP Grade 4 Reading Results for Minnesota and the Nation

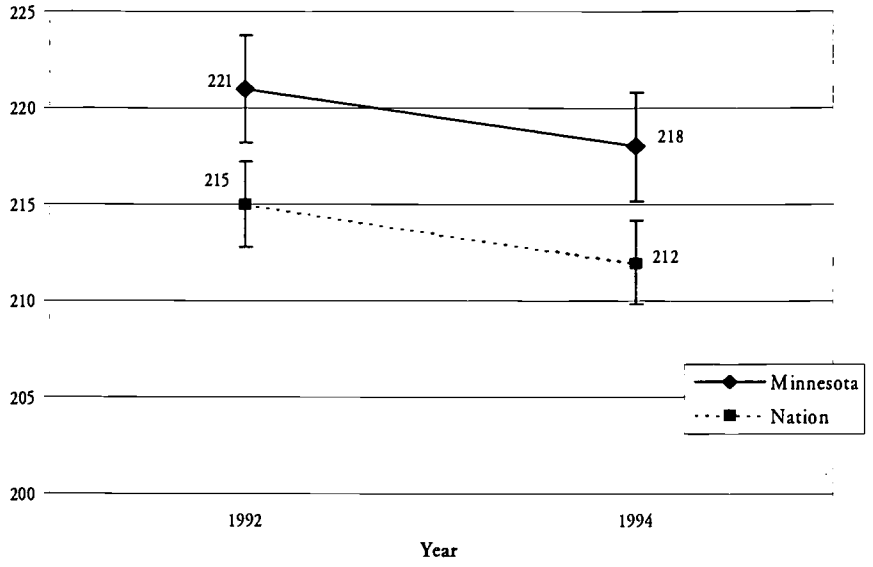
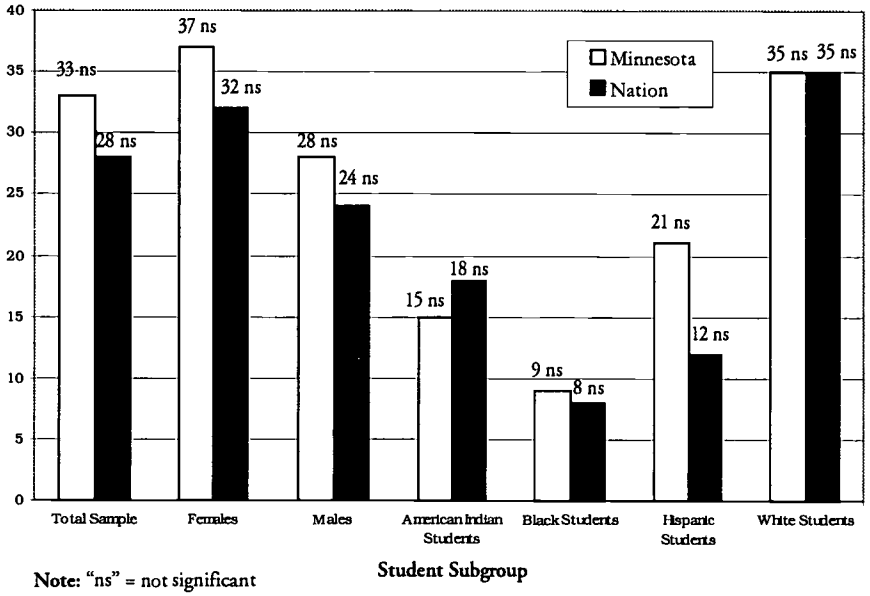


Figure 5.2 1994 NAEP Grade 4 Reading: Percent Proficient by Subgroup



Note: "ns" = not significant

Drawing Conclusions from the NAEP Fourth Grade Reading Assessment

There are disappointing trends in these data. First, there is the decline in scores from 1992 to 1994. We strongly hope that the upcoming 1998 NAEP reading assessment will show a reversal of this trend. Second, Minnesota's ethnic groups did *not* consistently outscore their counterparts nationwide. Nevertheless, our major purpose in examining these data was to benchmark the performance of Minnesota students against those from other states. Despite the decline in scores from 1992 to 1994, only Maine's students clearly outscored Minnesota students, and the reading achievement of our fourth graders remains near the top nationally.

Fourth Grade Mathematics Achievement

Figure 5.3 shows the mean scale score of fourth grade students in the 1992 and 1996 NAEP Mathematics Assessment, for both Minnesota and the nation. Over the four-year period covered by this assessment, achievement in Minnesota and the nation improved. Scaled scores in Minnesota rose from 228 to 232, with the proportion of students scoring at the Proficient level increasing by 3%.

Figure 5.3 1992-96 NAEP Grade 4 Mathematics Results for Minnesota and the Nation

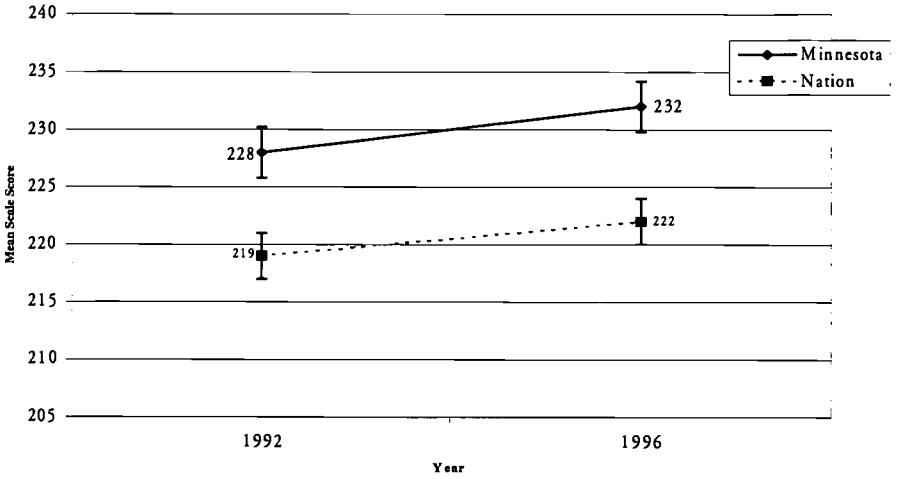
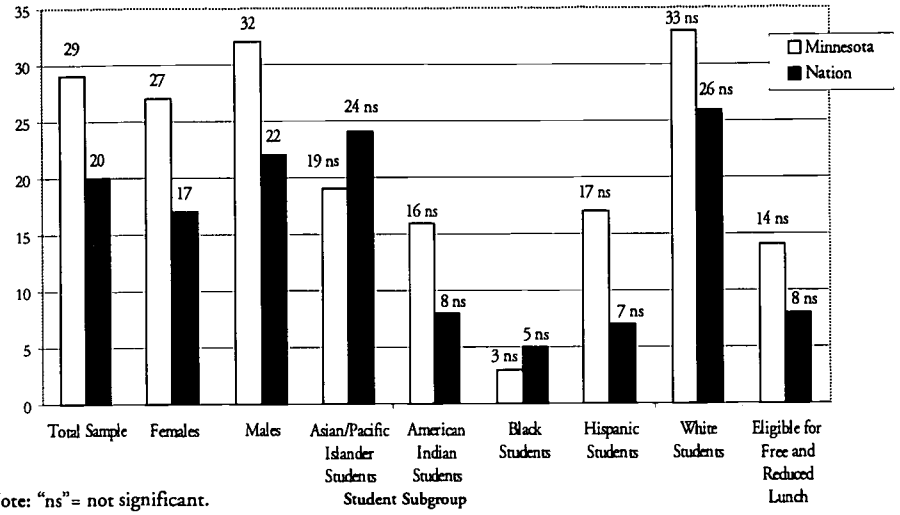


Figure 5.4 1996 NAEP Grade 4 Mathematics: Percent Proficient by Subgroup



Note: "ns"= not significant.

Minnesota fourth grade students scored well above the national average both years. In 1996, none of the 44 states which participated in the Grade 4 State NAEP mathematics test administration had a scaled score mean above 232 (although Maine and Connecticut tied with Minnesota), and only Connecticut had more fourth graders at the Proficient Level—31% as compared to 29% in Minnesota.

The success of this performance by Minnesota fourth graders in 1996 is further detailed in Figure 5.4, which shows the comparative performance of various Minnesota student subgroups against their national counterparts. While both boys and girls showed significantly higher percentages of students achieving proficiency, no ethnic group performed significantly different than its national counterpart.

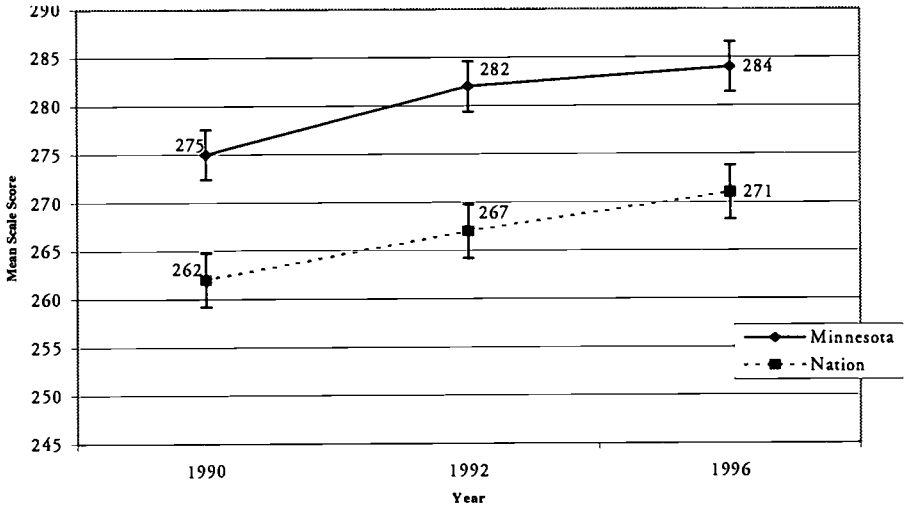
At both fourth and eighth grade, the achievement of Minnesota students compared extremely well with that of other states in the U.S., but in mathematics, comparing favorably to other states does not make the performance internationally competitive. Based on American students' performance in the TIMSS assessment, a re-analysis of our mathematics curriculum seems warranted.

Eighth Grade Mathematics Achievement

Figure 5.5 shows NAEP data for eighth graders over the period from 1990 to 1996. Minnesota students score above the national average in all three years tested. In 1996, the Minnesota student average of 284 met or exceeded that of all the other 41 participating states.

Figure 5.6 (page 36) shows the percentage of public school eighth graders performing at the Proficient level in the 1996 NAEP Mathematics Assessment, for both Minnesota and the nation. Specific student groupings are broken out by gender, ethnicity, and socioeconomic status (i.e., eligible for free and reduced lunch vs. not eligible). Both boys and girls in Minnesota outscore their counterparts nationally. All Minnesota subgroups had a larger proportion of students scoring at or above the Proficient level than their national counterparts, though most of these differences are considered statistically insignificant (with the exception of students eligible for free and reduced lunch).

Figure 5.5 1990-92-96 Grade 8 Mathematics Results for Minnesota and the Nation



Drawing Conclusions from the NAEP Mathematics Assessments

No state clearly outperformed Minnesota students at either fourth or eighth grades. At both fourth and eighth grade, the achievement of Minnesota students compared extremely well to that of other states in the U.S. However, this does not mean that Minnesota's scores are highly competitive internationally.

Eighth Grade Science Achievement

The State Level NAEP Science Assessment was first administered in 1996 to eighth grade students in 40 states and U.S. jurisdictions. It enlisted the use of a new testing framework that featured many more

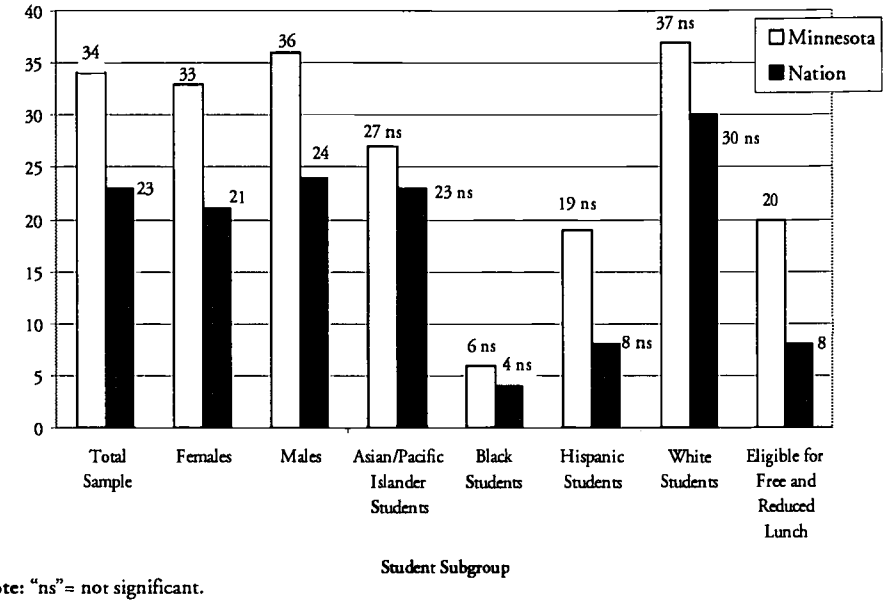
constructed-response questions and hands-on tasks to allow students to exhibit their abilities in integrating scientific concepts and in conducting scientific investigations. Minnesota's public school eighth graders achieved an average NAEP science scale score of 159, well above the national average scale score of 148, and significantly exceeded by only two other participating states (Maine and North Dakota).

Figure 5.7 displays the percentage of students within certain subpopulations that achieved at or above the Proficient Level of performance in the 1996 NAEP Science Assessment. As in the case of the 1996 NAEP Mathematics Assessment, each Minnesota eighth grade subgroup outperformed its national counterpart; however, only in the case of boys was this difference considered statistically significant.

Drawing Conclusions from the NAEP Science Assessments

Minnesota's performance in the NAEP science assessment is exceptional, with each student subgroup outperforming its national counterpart, and the state's average scale score significantly exceeded by only two other participating states. Future administrations of the NAEP science assessment will allow us to examine trends in our state's overall levels of science achievement.

Figure 5.6 1996 NAEP Grade 8 Mathematics: Percent Proficient by Subgroup



Note: "ns"= not significant.

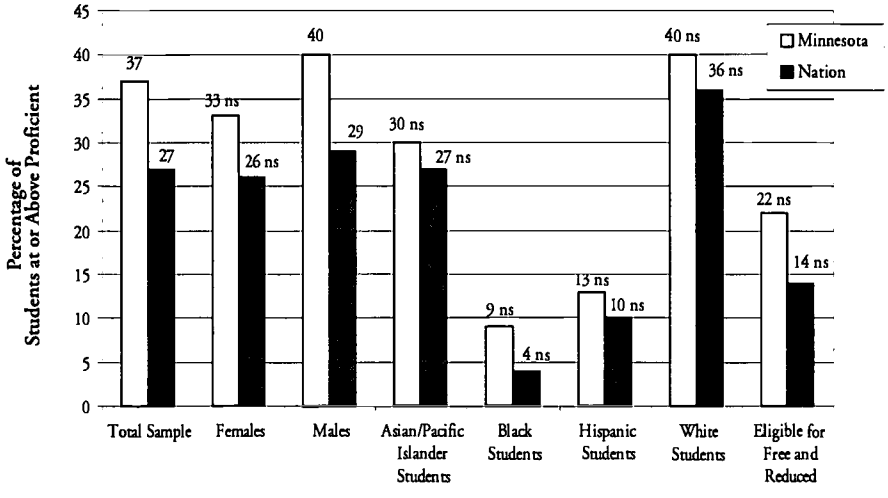
General Conclusions

Our ability to compare Minnesota student performance in reading to that of students in other states is limited by the fact that NAEP's State Level Reading Assessment has only been conducted on the achievement of fourth graders, with results available only for 1992 and 1994. Although Minnesota's overall mean scale score dipped slightly between these two administrations of the NAEP Reading Assessment, it is worth remembering that our state's 1994 overall mean scale score was significantly lower than that of only one other participating state (Maine), and was, in fact, statistically higher than 13 other participating jurisdictions. We are concerned, however, about the decline in scores from 1992 to 1994. Because of the emphasis on reading fostered by the Minnesota Graduation Standards, we hope to find that this decline has been reversed when NAEP releases findings from the 1998 administration of its state-level reading assessment.

Minnesota's public school eighth graders achieved an average NAEP science scale score of 159, well above the national average scale score of 148, and significantly exceeded by only two other participating states (Maine and North Dakota). In the most recent NAEP assessment, only eighth grade students in Singapore significantly outscored Minnesota students.

While there continues to be concern about the unevenness of mathematics performance across different ethnic groups, the NAEP math findings show

Figure 5.7 1996 NAEP Grade 8 Science: Percent Proficient by Subgroup



Note: "ns"= not significant.

several encouraging trends. First, Minnesota students scored well above the national average at both fourth and eighth grades and are virtually at the top of the states that have participated in the state-by-state comparisons. Second, scores have been increasing in Minnesota. It must be remembered, however, that in mathematics, being among the top states in the U.S. does not place Minnesota in the very top tier internationally.

Trend information in the NAEP Science Assessment is not yet available, since the state-level test was administered for the first time in 1996. Nevertheless, the overall performance of Minnesota eighth graders in the 1996 NAEP Science Assessment was impressive, when compared to the rest of the nation. Only two states reported significantly higher mean scale scores, and every student subgroup in Minnesota outperformed its counterpart nationally.

Student Performance in the Minnesota Achievement Testing Programs

The international and national studies provide a comparison of Minnesota student performance to that of students in other states and countries. Because the studies include only a sample of Minnesota students, these data do not provide a detailed look at achievement within the state. We now turn to data from Minnesota's statewide tests to look at performance across regions and segments of Minnesota.

In 1997-98, Minnesota began statewide testing in grades 3, 5, and 8 for all Minnesota students. The third and fifth grade examinations, called the *Minnesota Comprehensive Assessments*, or MCAs, measure reading and mathematics performance in third grade, and reading, mathematics, and writing performance in fifth grade. At both grade levels, the tests are aligned with the *High Standards* articulated in the *Profile of Learning*. The reading and mathematics portions contain both multiple-choice and short answer items, whereas the fifth grade writing test asks for a sample of the student's writing.

MINNESOTA'S PROFILE OF LEARNING PERFORMANCE PACKAGES: A SNAPSHOT FROM GRAND RAPIDS, MN

Learning Area: Scientific Application

Last year, middle school science teacher, Cheryl Smith, and her colleagues at Grand Rapids Middle School, implemented Tasks 2 and 3 from the performance package, "Weather," developed by the Department of Children, Families, and Learning (CFL).

After four weeks of studying weather, experimenting with instrumentation, and recording data, the students were asked to develop a question for further study. One student proposed this question and hypothesis (see darker box at center):

Question
How does the average temperature in December and January in Grand Rapids of this El Nino year compare with the average for the 5 most recent El Nino years and the 5 most recent non-El Nino years?

Hypothesis
"I think the order of averages will be, from highest to lowest: a) this year's average, b) the 5 other El Nino years' averages, and c) the 5 non-El Nino years' average temperatures. I think they will be in this order because this year's El Nino is predicted to be the largest one on record, and the other El Nino years are supposed to be warmer than non-El Nino years."

Once the question and hypothesis were approved, the students had to design a plan for data collection. This same student proposed the following data collection procedure:

Data Collection Design

She would collect temperature data for the months of December and January using the weather station in her science class and her father's weather station at home. The data would be collected at the same time every day. For previous years, she would also use weather data collected by the Forestry Experiment Laboratory at the Itasca Community College campus.

Once she had the daily temperatures for her years of study, she would calculate the monthly averages. This information would be recorded on weather data tables and eventually graphed.

Next the data collection plan had to be approved by the teacher. A checklist provided the students with an extra measure of assistance in the development of their plan.

Much of the research for the students' field study had to be conducted on their own time—"A big challenge for many students," Cheryl observed. Students were required to use three outside sources in their quest for the answer to their question. Cheryl commented that this was particularly difficult for some students who didn't have access to the Internet or transportation to the local library. In contrast, some students were very resourceful. "I was surprised at the number of students who made calls to news stations, airports, regional weather stations, or visited our university extension site." To further assist students in accessing resources, Cheryl built in research time during the school day. A progress checklist helped keep students on task and on the right track. It also helped Cheryl monitor the progress of her students.

The end product was a written report with appropriate graphs, charts, and written documentation. Students were expected to synthesize the information into a report that defended or refuted

(cont'd on p. 38)

SCIENTIFIC APPLICATION *(cont'd from p. 37)*

their particular weather hypothesis.

The report submitted by this student contained several observation tables documenting the average temperatures for her years of study. Using this information she created several computer generated bar graphs. She also included line graphs documenting humidity, atmospheric pressure, and temperature. The inset contains an *excerpt* from her conclusions:

Conclusion
"I conclude that my data refutes my hypothesis. My original hypothesis was that this year's average would be the highest, followed by the other El Nino years, then the non-El Nino years. This was not so. The warmest temperature was an El Nino year, 1982-83, but it was not this year, despite the predictions that this year's El Nino would break all records."

Since Cheryl was piloting Tasks 2 and 3 of the performance package on "Weather," she evaluated each student's performance based on the four-point scale developed by CFL to score the entire content standard (see box on p. 27). (Typically, the guidelines on the checklists evaluate work using "Y" or "N" (Y=yes, the student met the performance standard; N=no, the student did not meet the performance standard.)

The performance requirements for Task 3 included such things as: summarizing field study information accurately, supporting or refuting the hypothesis, and providing justification for conclusions about the hypothesis, using collected data and appropriate scientific concepts and principles.

Cheryl commented that at first, the students were overwhelmed by the performance package. The content standard, with its accompanying performance package, pushed the students beyond what had previously been expected of them. The solution was to break everything down into small steps. The checklists in the performance package made this possible, and it placed more of the responsibility for learning on the students. This created a path that students could follow to succeed.

In eighth grade, students take the multiple-choice *Basic Standards Tests* (BSTs), which cover reading and mathematics and are aligned with the basic standards in the *Minnesota Graduation Rule*. The eighth grade test is the student's first chance to demonstrate mastery of the high school basic requirements. Any student correctly answering at least 75% of the items meets the high school requirement set by the Minnesota Board of Education for reading or mathematics. Students who do not meet the minimum graduation standard will have additional opportunities to retake the test in later grades.

The BSTs have a clear passing score, 75%. The MCAs, however, use proficiency levels similar to NAEP assessments. (See sidebar text on p. 29 for definitions of the various levels of student performance in the MCA testing program.) These proficiency levels are similar to grades in that they describe where students' achievement falls on a continuum; also, as with letter grades, all students will not reach the same point on the continuum in each test every year. That is, while we might wish all our children earned A's in every subject every year, it would be unrealistically demanding to expect it. Similarly, we genuinely wish all children could score at Level III on the tests, but this is a level of accomplishment that cannot be realistically expected of all children. In fact, school districts in the metropolitan area have found that Level III performance is equivalent to very high performance (ranging from the 68th to the 73rd percentile) on other norm-referenced achievement tests administered by these districts (J. Angermeyer, personal communication, Nov. 2, 1998). Continuing the analogy with grades, C's are passing grades representing an acceptable level of performance, but they are not all we might wish for our children. Level II is an acceptable level of performance, but it is less than we might hope.

In this section, we are trying to evaluate the performance of students across various segments and regions of Minnesota. After presenting statewide data, we turn to issues of ethnic and gender differences.

Throughout the education literature, achievement test scores are correlated with student poverty (eligibility for free or reduced lunch), mobility (frequent school or residence changes), and limited English proficiency. Therefore, in accordance with the 1998 Minnesota Omnibus Education Act, Subdivision 1 and to provide context for the test scores, our tables include data on the percentage of test-takers who are in poverty, the percentage who recently moved into the district (mobility), and the percentage who are categorized as having limited English proficiency. Also in accordance with Minnesota statute, Appendix A includes additional data on all students except those with limited English proficiency, all students except those new to their district, and all students except those receiving special education. Finally, to comply with the reporting recommendations of the 1997 amendments to the federal Individuals with Disabilities Education Act (IDEA), we have reported separate data on students in special education.

THIRD GRADE *MINNESOTA COMPREHENSIVE ASSESSMENT* RESULTS IN READING AND MATHEMATICS

Tables 5.7 and 5.8 (p. 39) show results for all third grade students in the MCA reading and mathematics assessments. Tables A.1 through A.6 (see Appendix A) show the data for all students except those with limited English proficiency, those new to their district since January 1977, and those

in special education.

More than 60,000 students took the tests, or 93% of the third graders enrolled at the time of testing. Seventy-seven percent of tested third graders scored at or above Level II in the MCA reading test; 82% were at or above Level II in mathematics. On both tests, 35% of the students scored at or above Level III.

Fifth Grade *Minnesota Comprehensive Assessment* Results in Reading, Mathematics, and Writing

Tables 5.9 through 5.11 show the fifth grade MCA results in reading,

Table 5.7 ***1998 Grade 3:*** **Minnesota Comprehensive Assessment** ***Results in Reading for all Public School Students Tested***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	60577	35	77	1410	93	4	11	10	31
Girls	29792	41	82	1435	94	4	7	10	32
Boys	30663	30	73	1386	92	5	15	10	31
Asian	2847	17	52	1302	93	62	5	13	70
Black	3692	11	46	1264	90	4	14	16	82
Hispanic	1486	16	54	1300	86	38	10	18	70
American Indian	1204	15	56	1303	89	0+	18	17	75
White	50542	39	83	1434	94	0+	11	9	24
Special Ed	6696	12	41	1248	82	2	—	10	44
LEP	2612	4	34	1222	87	—	6	13	87
Metro Area	32683	37	76	1410	92	7	10	10	30
Outstate	27759	34	79	1410	93	2	12	10	34
Mpls/St. Paul	7792	18	51	1298	89	22	9	11	69
TC Suburbs	24846	42	84	1445	93	2	10	10	17
Outstate: 2000+	13700	34	79	1409	92	3	12	8	31
Outstate: 2000 -	14059	34	79	1411	94	1	12	11	36
Public/Charter	276	21	52	1302	82	13	12	56	62
Public/Not Charter	60301	35	78	1410	93	4	11	10	31
Non-public	1315	43	88	1455	—	—	—	—	—

Table 5.8 ***1998 Grade 3:*** **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	60685	35	82	1401	93	4	11	10	31
Girls	29738	34	82	1397	93	4	7	10	31
Boys	30805	36	82	1406	92	4	15	10	31
Asian	2821	19	64	1299	92	62	5	13	70
Black	3670	8	48	1199	90	4	14	16	82
Hispanic	1484	14	59	1256	86	38	11	19	70
American Indian	1191	16	67	1292	88	0+	18	17	75
White	50472	40	87	1431	94	0+	11	9	24
Special Ed	6744	14	55	1246	83	3	—	10	44
LEP	2606	7	48	1202	87	—	6	14	87
Metro Area	32701	37	81	1403	93	7	10	10	29
Outstate	27801	33	84	1399	93	2	12	10	33
Mpls/St. Paul	7800	19	59	1274	89	22	10	11	68
TC Suburbs	24901	43	88	1444	94	2	10	9	17
Outstate: 2000+	13669	33	83	1396	92	3	12	8	31
Outstate: 2000 -	14132	33	85	1403	94	1	12	11	36
Public/Charter	301	19	57	1259	89	12	13	55	59
Public/Not Charter	60384	35	82	1402	92	4	11	10	31
Non-public	1311	40	88	1434	—	—	—	—	—

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

mathematics, and writing for all public school students tested. Tables A.7 through A.15 (see Appendix A) show results for all students except those with limited English proficiency, all students who attended school in their district for at least one year before the test, and all students except those in special education.

More than 60,000 students (95% of all those enrolled) took the MCA fifth grade assessments. Thirty-eight percent demonstrated the solid academic performance expected at Level III or above in reading. The corresponding figures for mathematics and writing were 31% and 42%. In reading, mathematics, and writing, 79%, 80%, and 80% respectively, scored at or above Level II.

Table 5.9 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment *Results in Reading for all Public School Students Tested***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	60492	38	79	1419	95	4	13	9	29
Girls	29484	43	83	1444	96	3	8	9	29
Boys	30958	34	76	1395	94	4	17	9	29
Asian	2786	22	59	1323	97	52	8	11	65
Black	3271	13	46	1254	93	4	20	16	77
Hispanic	1305	16	54	1290	91	34	17	17	66
American Indian	1165	15	58	1292	90	0+	21	13	73
White	51088	42	84	1443	96	0+	13	8	22
Special Ed	7794	10	39	1230	89	3	—	9	42
LEP	2154	4	33	1201	93	—	12	13	88
Metro Area	31575	40	78	1423	95	6	12	9	27
Outstate	28633	36	80	1415	95	1	14	8	31
Mpls/St. Paul	7009	21	54	1301	94	20	15	10	66
TC Suburbs	24566	45	85	1458	96	1	12	8	16
Outstate: 2000+	14054	38	80	1419	94	2	14	8	28
Outstate: 2000 -	14579	35	80	1412	96	1	13	9	34
Public/Charter	233	26	59	1322	94	13	24	51	50
Public/Not Charter	60259	38	79	1420	95	4	13	9	29
Non-public	1334	45	88	1461	—	—	—	—	—

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table 5.10 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment *Results in Mathematics for all Public School Students Tested***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	60362	31	80	1395	95	4	13	9	29
Girls	29305	30	80	1393	95	3	8	9	29
Boys	30995	32	79	1397	95	4	17	9	29
Asian	2779	19	63	1315	96	52	9	11	65
Black	3233	7	41	1211	92	4	20	16	77
Hispanic	1293	11	52	1262	90	34	17	17	66
American Indian	1157	10	55	1273	90	0+	21	14	73
White	51008	35	84	1419	95	0+	13	8	22
Special Ed	7790	11	47	1242	89	3	—	9	42
LEP	2149	4	40	1207	93	—	12	13	88
Metro Area	31419	34	79	1401	95	6	13	9	27
Outstate	28660	28	80	1389	95	1	14	8	31
Mpls/St. Paul	6948	16	54	1281	93	20	15	10	66
TC Suburbs	24471	39	86	1435	95	1	12	8	16
Outstate: 2000+	14022	29	81	1394	94	2	14	7	28
Outstate: 2000 -	14638	28	80	1385	96	1	13	9	34
Public/Charter	234	18	60	1294	95	14	23	50	50
Public/Not Charter	60128	31	80	1395	95	4	13	8	29
Non-public	1329	33	89	1420	—	—	—	—	—

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

EIGHTH GRADE *BASIC STANDARDS TESTS* IN READING AND MATHEMATICS

Tables 5.12 (below) and 5.13 (p. 42) show the eighth grade *Basic Standards Test* results in reading and mathematics for all students tested. Tables A.16 through A.21 (see Appendix A) show the results for all students except those with limited English proficiency, all students except those new to the district since January 1, 1997, and all students except those in special education.

Over 64,000 students participated in the testing, 96% of all eighth graders enrolled. Sixty-eight percent of the 64,000 test-takers met the state's minimum standard for high school graduation in reading. Seventy-one percent met the standard in mathemat-

Table 5.11 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment** ***Results in Writing for all Public School Students Tested***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	60364	42	80	1393	95	4	13	9	29
Girls	29420	52	87	1496	96	3	8	9	29
Boys	30891	32	74	1296	94	4	17	9	29
Asian	2757	35	76	1325	96	52	8	11	65
Black	3184	21	57	1131	91	4	19	16	77
Hispanic	1274	25	64	1202	89	33	17	16	66
American Indian	1139	19	61	1145	88	0+	20	13	73
White	51123	45	83	1426	96	0+	12	9	22
Special Ed	7607	15	51	1041	87	3	—	9	42
LEP	2088	18	60	1141	90	—	12	12	88
Metro Area	31443	44	81	1413	95	5	12	9	27
Outstate	28642	39	79	1372	95	1	13	8	31
Mpls/St. Paul	6884	29	65	1227	93	20	14	10	66
TC Suburbs	24559	49	85	1465	96	1	12	8	16
Outstate: 2000+	14055	40	80	1378	94	2	13	7	28
Outstate: 2000 -	14587	38	79	1366	96	1	13	9	34
Public/Charter	231	31	64	1207	94	13	21	50	50
Public/Not Charter	60133	42	80	1394	95	3	13	8	29
Non-public	1334	43	81	1409	—	—	—	—	—

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table 5.12 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Reading for all Public School Students Tested***

Category	Number Tested	%Meeting H.S. Minimum Standard	Mean Number Correct	% Enrolled Students Tested	%LEP Students in Score	%Special Ed Students in Score	%New to District Since 1/1/9	%F/R Lunch Students in Score
Total	64403	68	31.19	96	2	12	7	24
Girls	31146	71	31.76	96	2	7	7	24
Boys	32416	66	30.79	96	3	16	7	24
Asian	2769	48	27.83	93	36	7	10	62
Black	2684	32	24.38	89	5	23	16	72
Hispanic	1256	39	25.89	88	27	16	18	62
American Indian	1134	38	26.06	88	0+	24	14	64
White	55098	73	32.01	97	0+	11	6	18
LEP	1579	16	21.58	85	—	12	14	89
Special Ed	7530	27	23.18	87	2	—	11	41
Metro Area	31121	68	31.13	95	4	12	7	22
Outstate	32805	68	31.28	96	1	12	7	26
Mpls./St. Paul	6215	41	26.32	89	17	17	9	64
TC Suburbs	24906	75	32.33	97	1	10	6	12
Outstate: 2000+	16122	69	31.34	96	2	12	6	23
Outstate: 2000-	16683	68	31.22	97	0+	12	8	29
Public/Charter	182	43	26.12	98	1	26	45	51
Public/Not Charter	64221	68	31.20	96	2	12	7	24
Non-public	4153	83	34	—	—	—	—	—

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table 5.13 ***1998 Grade 8: Basic Standards Test Results in Mathematics for all Public School Students Tested***

Category	Number Tested	% Passing	Mean Number Correct	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% New to District Since 1/1/9	% F/R Students in Score
Total	64397	71	53.74	96	3	12	7	24
Girls	31131	70	53.55	96	2	7	7	25
Boys	32362	73	54.24	96	3	16	7	24
Asian	2775	53	48.55	93	36	7	9	62
Black	2694	26	38.49	89	6	23	15	72
Hispanic	1239	38	43.53	87	27	15	18	62
American Indian	1139	39	44.18	88	0+	24	14	64
White	55051	76	55.38	97	0+	11	6	19
LEP	1584	23	37.78	85	—	11	14	89
Special Ed	7523	29	39.65	87	2	—	11	41
Metro Area	31075	70	53.34	95	4	12	7	22
Outstate	32838	72	54.20	96	1	12	7	26
Twin Cities	6229	41	43.76	89	17	17	9	64
TC Suburbs	24846	77	55.74	97	1	10	6	12
Outstate: 2000+	16145	72	54.41	96	2	12	6	23
Outstate: 2000-	16693	71	53.99	96	0+	12	8	29
Public/Charter	178	40	42.37	96	1	27	44	51
Public/Not Charter	64219	71	53.77	96	3	12	7	24
Non-public	4153	82	57.00	—	—	—	—	—

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

ics. As with the MCA, results varied widely across regions of the state.

The large number of eighth grade students failing to meet the high school minimum on the *Basic Standards Tests* remains one of the state's most pressing educational problems. By high school, students should move beyond basic skills to more challenging outcomes in core subjects, in vocational training, and in the arts.

Equity and Excellence Across Gender and Ethnicity

For the past several decades, "equity" and "excellence" have been guiding ideals in education. Schools have sought higher levels of excellence as demonstrated by better student performance. At the same time, they have sought to distribute that excellence more equitably across students of color, gender, and rich and poor students. Both equity and excellence are essential to achieving society's diversity goals. We now turn to a consideration of how equitably excellence has been achieved across gender and ethnicity.

Achievement by Gender

Figures 5.8 through 5.10 compare the performance of girls and boys in third, fifth, and eighth grades respectively. These three figures graphically portray the data for girls and boys from Tables 5.7 through 5.13 (pp. 39–42). In reading, the direction of the difference is consistent across grades; girls outperformed boys at every grade level. For instance, in third grade, 82% of girls and 73% of boys scored at or above Level II; 41% of girls and 30% of boys scored at or above Level III. In fifth grade, 83% of girls and 76% of boys scored at or above Level II; 43% of girls and 34% of boys scored at or above Level III. In eighth grade, 71% of girls and 66% of boys met the high school minimum standard in reading. These differences are attributable, in part, to the higher propor-

Figure 5.8 Grade 3 Percentage of Students at or above Level II and Level III for Reading and Mathematics, by Gender

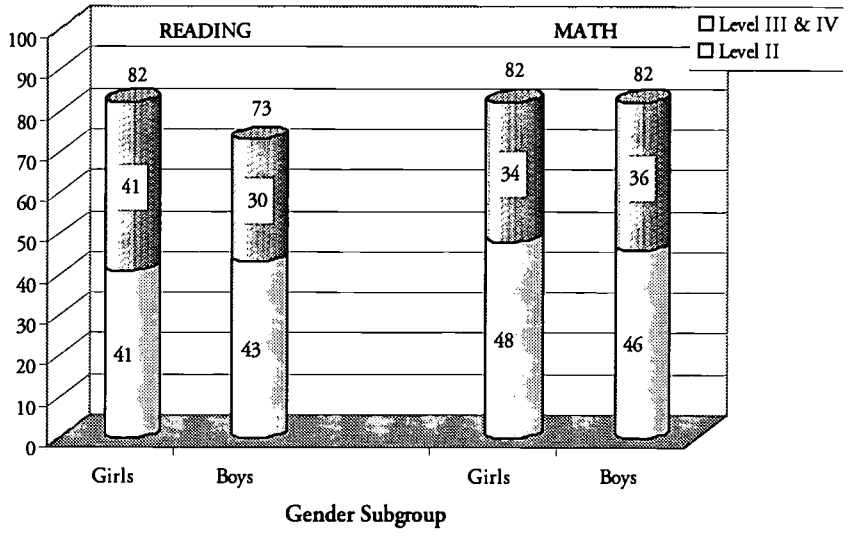
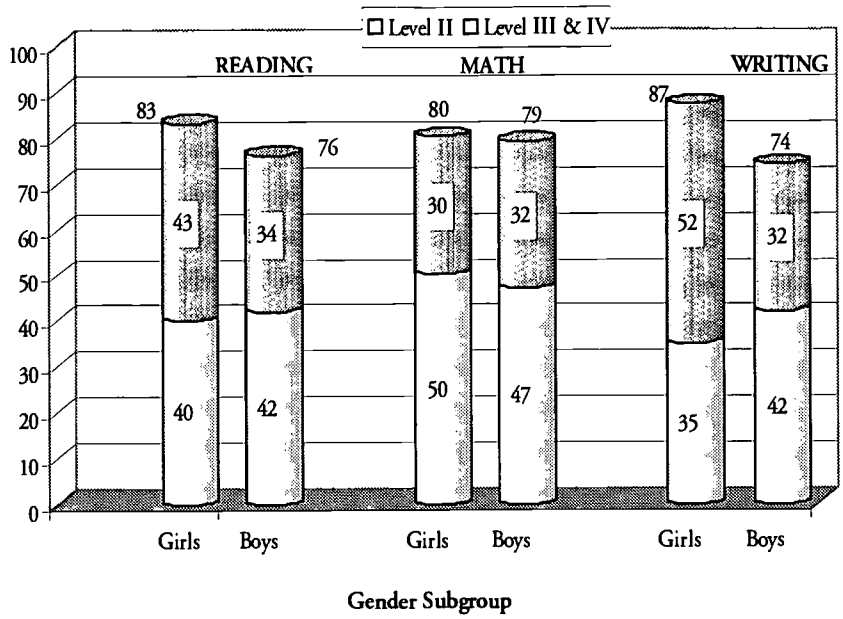


Figure 5.9 Grade 5: Percentage of Students at or above Level II and Level III for Reading, Mathematics, and Writing, by Gender



tion of boys in special education. As seen in Tables 5.7 through 5.13 (pp. 39–42), roughly twice as many boys as girls are in special education and classified as having a disability.

Results are less consistent across grades in mathematics. In third grade, 82% of both boys and girls scored at or above Level II; 34% of girls and 36% of boys scored at or above Level III. In fifth grade, essentially the same percentage of girls as boys scored at or above Level II (80% for girls vs. 79% for boys) and Level III (30% for girls vs. 32% for boys). In eighth grade, more boys met the high school minimum standard in mathematics: 73% versus 70%. Gender differences in mathematics tend to be smaller than in other subject areas on the statewide tests.

The largest gender difference is in fifth grade writing where 87% of girls and 74% of boys scored at or above Level II; 52% of girls and 32% of boys displayed the solid mastery of challenging material characteristic of Level III. Again, some of this difference is attributable to the higher percentage of boys with a disability and placed in special education.

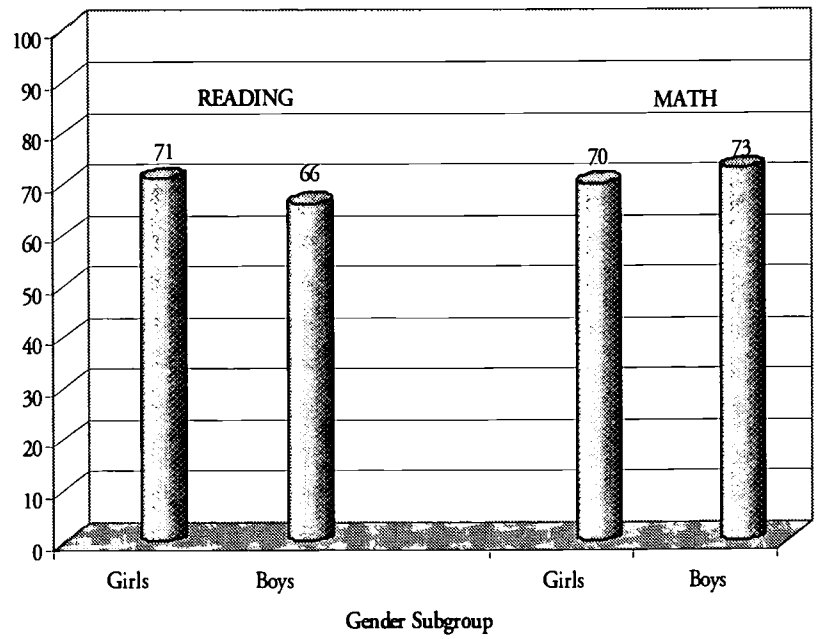
ACHIEVEMENT BY ETHNIC GROUP

Figures 5.11 through 5.13 (p. 44) show the statewide achievement test scores by ethnic groups in third, fifth, and eighth grades respectively. They graphically portray ethnic data from Tables 5.7 through 5.13. These ethnic differences are generally larger and more consistent across subject matter than the gender differences of Figures 5.8 through 5.10. In interpreting these differences, one must remember that minority test-takers include: (a) a high percentage of economically disadvantaged students eligible for free and reduced lunch in all minority ethnic groups, (b) a large percentage of students with limited English proficiency among Asian and Hispanic students, and (c) a large percentage of students in special education in all non-Asian minority groups. These percentages are shown in Tables 5.7 through 5.13.

Across all grades and subject matters, the minority ethnic groups scored lower than the state as a whole. Black students exhibited the lowest performance, but also the highest rates of poverty and placement in special education. Asian students outperformed the other ethnic minority groups at fifth and eighth grades. In third grade, however, the scores of Asian students are more comparable to those of Hispanic and American Indian students.

(cont'd on p. 45)

Figure 5.10 Grade 8: Percentage of Students Meeting High School Minimum Standard for Reading and Mathematics, by Gender



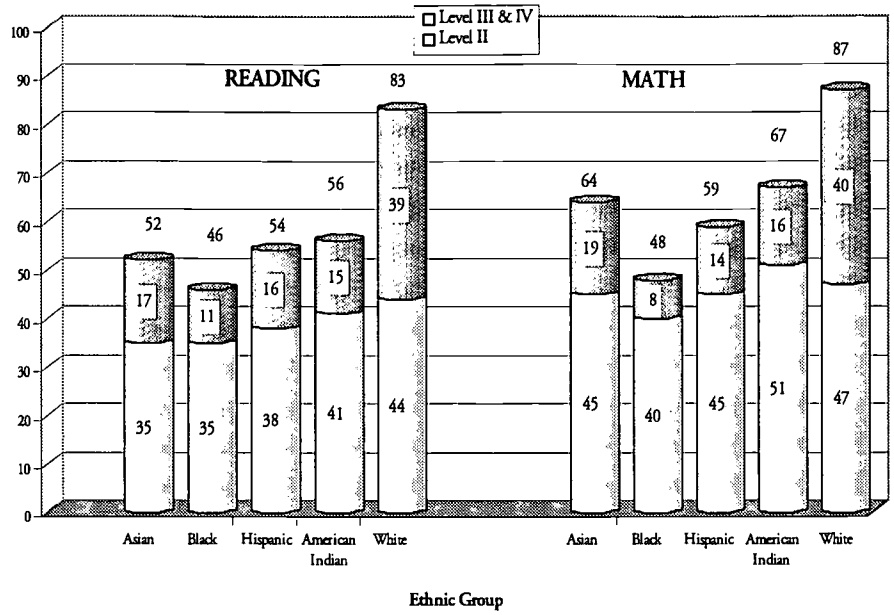
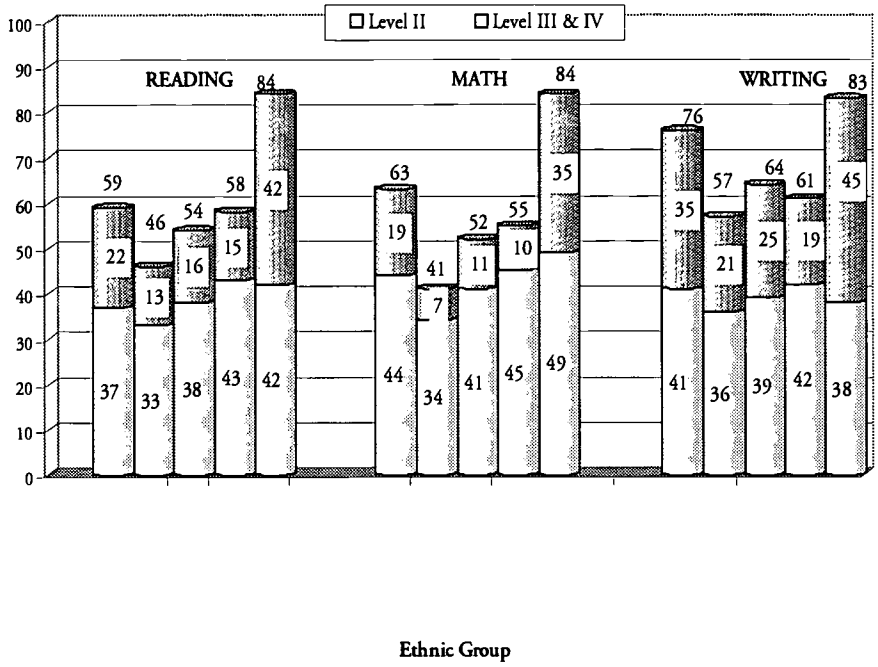


Figure 5.11 ***Grade 3: Percentage of Students at or above Level II and Level III for Reading and Mathematics, by Ethnicity***

Figure 5.12 ***Grade 5: Percentage of Students at or above Level II and Level III for Reading Mathematics, and Writing, by Ethnicity***



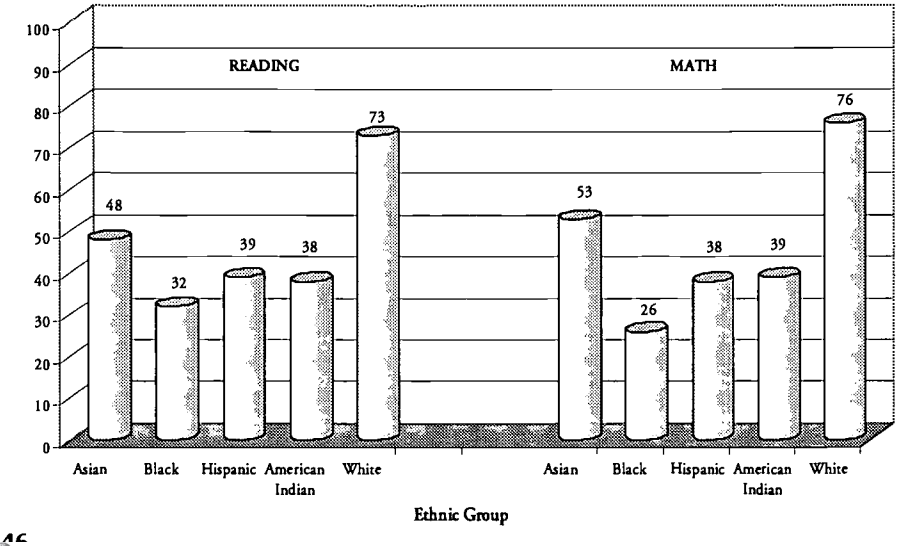
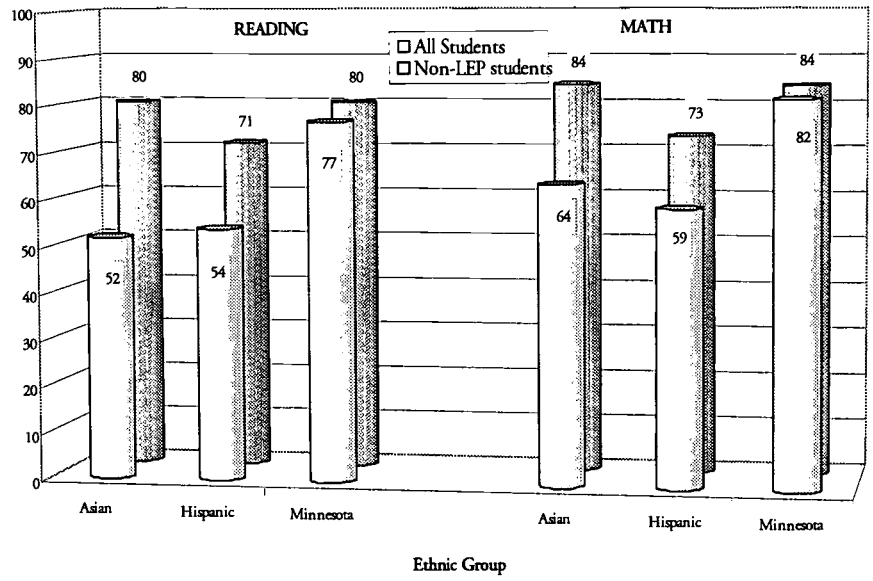


Figure 5.13 ***Grade 8: Percentage of Students Meeting* Basic Standard *for Reading and Mathematics, by Ethnicity***

Any approach to higher achievement must encompass all students. The issues discussed below apply to all students, but they tend to be more prevalent among minority and economically disadvantaged students. Achieving equity of outcomes among Minnesota's ethnic groups poses the difficult challenge of achieving equity among groups with very different rates of disabilities, English proficiency, and poverty. A program to address such differences goes beyond the scope of this report; nevertheless, these data point to factors that any such program should consider. For the sake of brevity, we will limit this discussion to trends in our data, even though this leads to a largely incomplete discussion of differences among groups. Some related issues concerning attendance and course-taking in high school were addressed in Chapter Four.

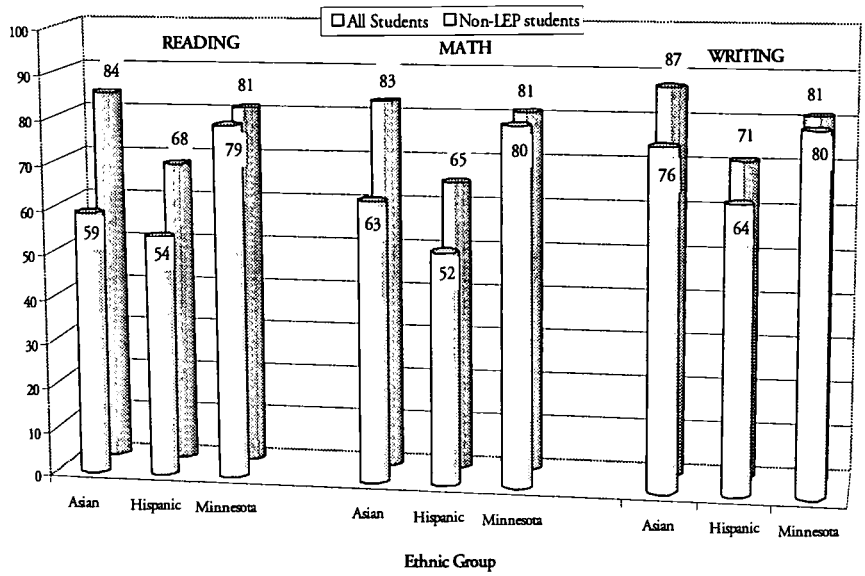
First, large differences appear by third grade, the earliest grade for which statewide achievement data are collected. Any solution will need to encompass early childhood development through programs at the preschool and early elementary levels. Early childhood development must mesh seamlessly with the primary grades by laying the social and cognitive foundations for later school learning.

Figure 5.14 Grade 3: Percentage of Students (with and without LEP) at or above Level II for Reading and Mathematics, by Ethnicity



The second factor is highlighted by Figures 5.14 through 5.16 (pp. 45–46). The figures show data on Asian and Hispanic students when those with limited English proficiency are and are not included. Among Asian students, those with limited English proficiency constitute from 36% (eighth grade) to 62% (third grade) of the students tested. Among Asian students, the differences with statewide data disappear at third and fifth grade in all subject areas when only English proficient students are considered, and the differences between Asian and statewide results become small at eighth grade. Similar trends are seen in the data of Hispanic students, although the trends are not as strong. All of this highlights the role of English proficiency and English language learning in addressing the problems faced by many Asian and Hispanic students.

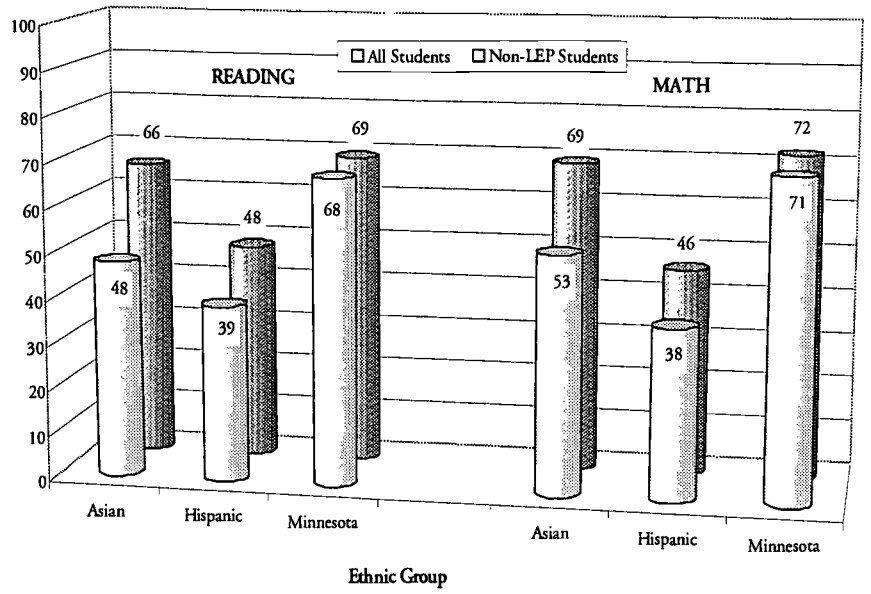
Figure 5.15 Grade 5: Percentage of Students (with and without LEP) at or above Level II for Reading, Mathematics, and Writing, by Ethnicity



At first, it may seem that language development is not critical to understanding the performance of American Indian and Black students, few of whom are classified as having limited English proficiency. However, Asian and Hispanic students' achievement is closely tied to their level of English proficiency, which highlights the importance of language development to achievement. Researchers such as Hart and Risley (1995) have emphasized the importance of early language stimulation for economically disadvantaged students and the relationship of that stimulation to later school performance.

Finally, at all grade levels and subject matters in Tables 5.7 through 5.13, a higher percentage of American Indian,

Figure 5.16 Grade 8: Percentage of Asian and Hispanic Students (with and without LEP) Meeting Basic Standard for Reading and Mathematics



Black, and Hispanic students are new to their districts. Such mobility has long been associated with a disrupted educational experience and low achievement. This problem can be addressed only through combining efforts to reduce student moves, particularly midyear changes of schools or districts, with adjustments in school programs that better accommodate such mobility.

In a document like this, we would not presume to make anything more than a cursory attempt at discussing solutions for the differences in achievement across ethnic groups. In the end, however, it simply comes down to the fact that the large ethnic and racial differences in reading, writing, and math across all grades are simply incompatible with society's diversity goals.

Charter and Non-Public Schools and School Choice

Increasingly, Minnesota offers students educational choices through open enrollment, post-secondary options, private schools, home schooling, and charter schools. Tables 5.7 through 5.13 (pp. 39–42) report statewide achievement test data on public charter schools and non-public schools.

Charter Schools

Minnesota passed the nation's first charter school legislation in 1991. Charter schools are legally and financially independent public schools. They constitute an exciting and rapidly expanding segment of Minnesota's public schools. Preliminary estimates from the Department of Children, Families, and Learning (1998a) show that enrollment grew from 2390 to 3708 between 1997 and 1998, a 55% increase.

Tables 5.7 to 5.13 show test results for Minnesota charter schools. The achievement levels of charter schools vary widely. Overall, however, performance of students in charter schools lags behind that of other public schools outside the urban areas of Minneapolis and St. Paul. For instance, Table 5.12 shows that 43% of charter students met the state's minimum high school graduation standard in reading, as compared to 68% for the state as a whole. Table 5.13 shows that 40% met the state's minimum high school graduation standard in mathematics, as compared to 71% for the state as a whole. At least in part, these results can be attributed to student characteristics. More than half of eighth grade charter school students (51%) are economically disadvantaged students, eligible for free or reduced lunch, as compared to 24% statewide. And more than twice as many are students with disabilities (27% as compared to 12% statewide). It is also important to note that Minnesota charter schools often receive less funding per pupil unit than do traditional public schools (Mandala, 1998). Charter schools do not receive any excess levies that regular districts can access through voter approval.

Nevertheless, the achievement levels in charter schools pose a challenge to parents and to the agencies which charter those schools. School choice places a heavy responsibility on parents and students for the selection of schools and programs that are best suited to the abilities and goals of the student. All parents and students need to ask questions and carefully read materials about any school, public or private, before making a selection. Parents and students should also consult the Graduation Standards button on the web site of the Department of Children, Families, & Learning for information about the school's achievement levels and other contextual factors. The web site's address is http://cfl.state.mn.us . Some charter schools serve large numbers of at-risk students, and therefore may have programs best suited to such students.

> *. . . achievement levels in charter schools pose a challenge to parents and to the agencies which charter those schools.*

The second challenge is to sponsoring agencies. These agencies are charged with the responsibility of reviewing the charter school's performance at least every three years as part of the charter renewal process. The charter school legislation (Minnesota

Statute 120.064, 1997) makes clear that the review is to be results-oriented, and advises, "A charter school must design its program to at least meet the outcomes adopted by the state Board of Education for public school students." Charter schools must adequately prepare their students for both the Graduation Rule's *Preparatory* and *High Standards*. In charter schools that do not extend through the twelfth grade, the sponsoring agency must consider how students transferring to other public and private schools for high school graduation will meet the required standards.

Non-Public Schools

Minnesota has 514 non-public schools; most of these serve relatively small numbers of children compared to their public school counterparts. Consequently, while more than 20% of the schools in Minnesota are non-public schools, non-public schools enroll only 10% of our state's student population.

All public schools are required to participate in statewide testing, and must test all students, with certain exceptions for students with disabilities and those with limited English proficiency. In contrast, non-public schools participate in testing on a voluntary basis. Furthermore, given the scarcity of available data on non-public schools' student demographics, there is currently no way to determine whether the test takers are representative of non-public school students in terms of family income and other factors associated with achievement. Nor can we determine whether differences in public and non-public student performance are related to differences in student characteristics beyond the control of schools, such as poverty, limited English proficiency, disabilities, etc.

Comparisons between public and non-public school performance are questionable at best, and therefore some earlier reports have omitted the non-public school data. We have included the data in Tables 5.7 through 5.13. *Conclusions based on comparisons between public and non-public schools are very tentative.*

At third and fifth grade, the scores of non-public school students tend to be roughly comparable to those of public school students in the suburban schools, which in turn, tend to be higher than those for public school students as a whole. There are exceptions, notably in the fifth grade writing data, where the non-public scores are more comparable to those of public schools generally, and lower than the scores of suburban public schools. At eighth grade, the scores of the non-public school students are higher than the scores of public school students, including suburban students, for both mathematics and reading.

While ACT college admissions scores for Minnesota declined through the 1980s, they have risen through the 1990s. Of the states with 50% or more students taking the ACT, only one state had an overall average scale score higher than Minnesota in the 1998 ACT administration.

The Performance of Minnesota Students in College Admissions Testing

Tables 5.7 through 5.13 show data on all students for grades three, five, and eight. But what about Minnesota's college-bound students as they near the end of high school? Of the two college admissions tests, the *ACT Assessment* (ACT) and the *Scholastic Assessment Test* (SAT; formerly known as the *Scholastic Aptitude Test*), far more Minnesota high school seniors and juniors take the former. Therefore, ACT test results more completely reflect the performance levels of Minnesota students bound for two- and four-year colleges.

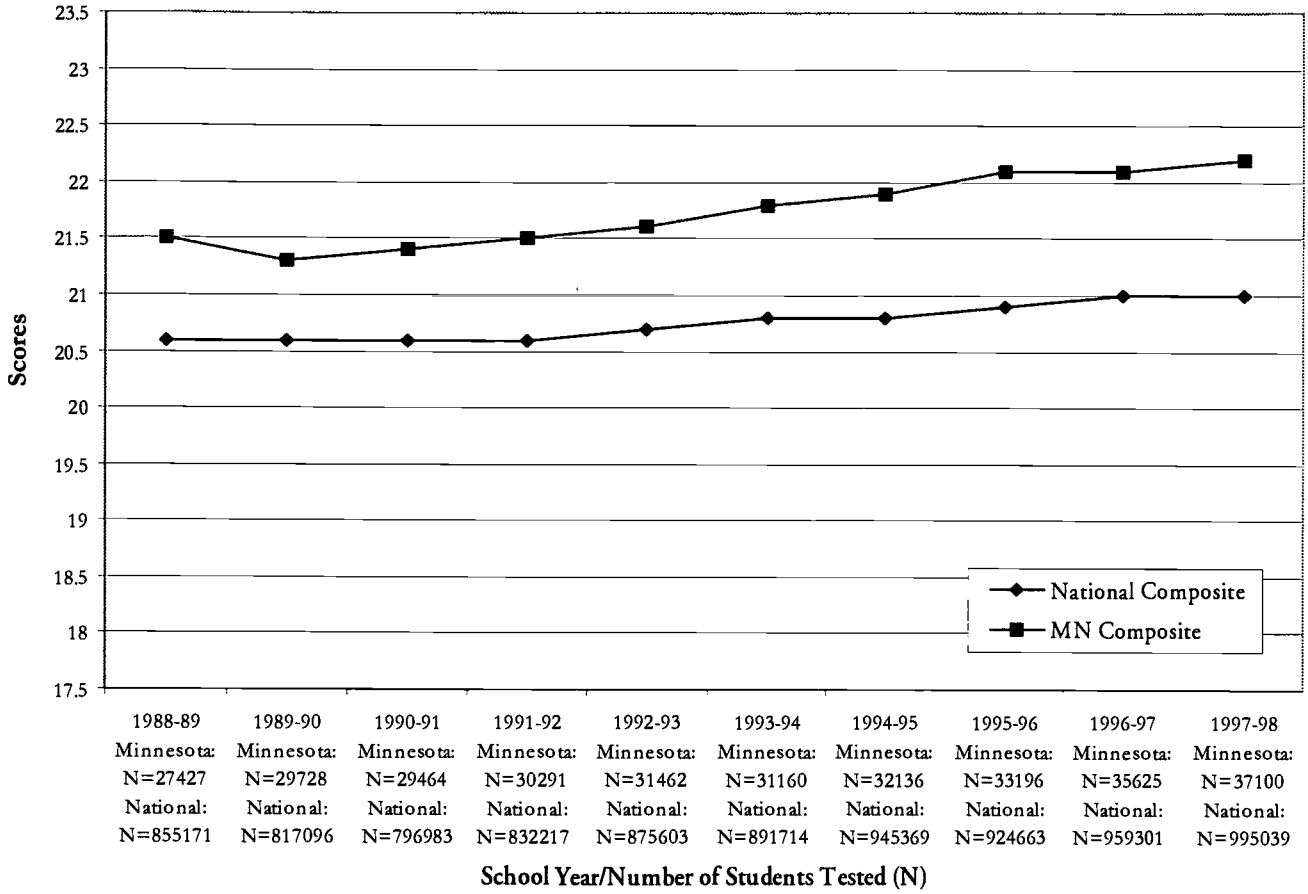
The decline in college admissions test scores through the 1970s and into the 1980s has been of national concern. In 1988, the Minnesota Legislative Auditor's Office reported that "Contrary to the national trend, Minnesota's ACT scores have continued to decline. Minnesota's composite ACT score in 1988 dropped to its lowest point in 21 years" (p. 15).

While ACT college admissions scores for Minnesota declined through the 1980s, they have risen through the 1990s. Figure 5.17 shows the trend since the last year of the auditor's report. Scores in Minnesota continued to decline for one more year. But since 1989–90, scores have increased slowly. This upward trend cannot be attributed to a declining number of test takers, since the number of Minnesota students taking the test rose steadily throughout the period. In the 1997-98 administration of the test, the national average score was 21.0, while state ACT averages ranged from 18.7 (in Mississippi) to 22.3 (in Wisconsin) for states in which at least 50% of graduates took the test. Of these states, only Wisconsin had a higher mean than Minnesota (22.3 vs. 22.2).

In 1997-98, 37,100 students in Minnesota took the ACT, 20,628 females and 16,472 males. These figures clearly attest to the increasing participation of women in undergraduate higher education, an increase that has been noted elsewhere, most recently in *The 1997 Minnesota High School Follow-up Study* (Minnesota Department of Children, Families, & Learning, 1998c). The figures reflect success at increasing the participation of women in higher education.

Figure 5.18 displays Minnesota student performance on the ACT for the 1997–98 year, with data broken down by gender and ethnicity. The general trends seem strongly related to

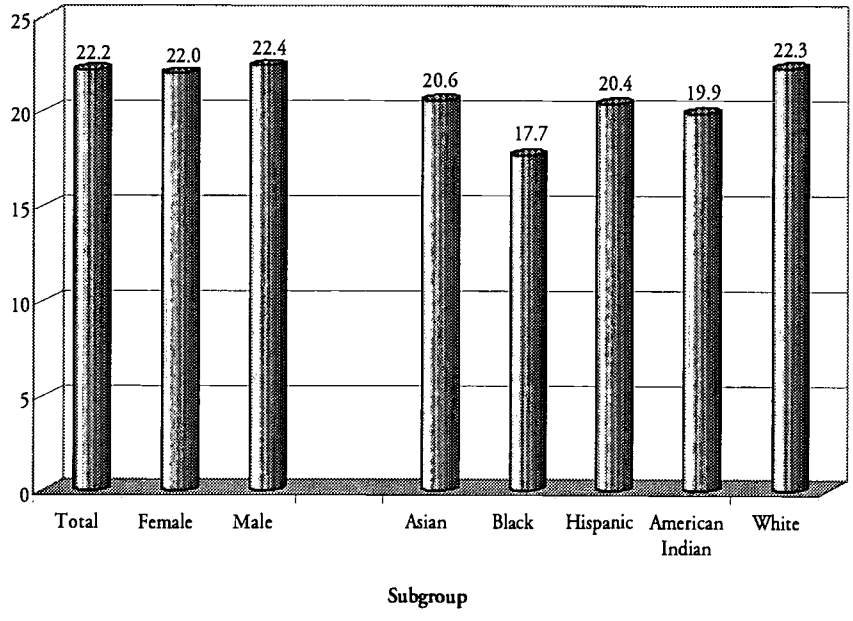
Figure 5.17 Minnesota and National ACT Composite Scores, 1988–98



the percentage of test takers from the various ethnic groups identified in Chapter Four as having taken ACT's recommended core course requirements. That is, those groups with higher percentages of students taking the recommended core course requirements generally have higher average ACT scores than those groups in which lower percentages of students complete the recommended coursework.

With the emphasis on minimum competency produced by the *Basic Standards Tests,* there has been concern that the education of high ability students may be neglected. The rising ACT scores shown in Figure 5.17 and the increasingly higher course preparation of college-bound students discussed in Chapter 4 should help to relieve this concern.

Figure 5.18 1997–98 Minnesota ACT Composite Scores, by Gender and Ethnicity



CHAPTER 6
FINDINGS AND CONCLUSIONS

In Minnesota's efforts at educational reform, there have been three key goals: greater choice, equity, and excellence. Our findings and conclusions are organized around these three issues.

EDUCATIONAL CHOICES

Since the 1980s, Minnesota has tried to widen the range of alternatives available to students. Students are no longer limited to a school in the district where they reside and can attend a public school of their choice under the state's open enrollment policy. High school students can also choose to attend a post-secondary institution under the Post-secondary Enrollment Options program. The 1991 charter school legislation opened a new type of public school operating under less restrictive regulations than other public schools, and therefore with more freedom for innovation. Tax deductions for tuition lighten the financial cost, at least somewhat, and therefore widen access to the private school system. These options not only enhance choice, they also increase the responsibility of students and parents to choose wisely among schools as well as among programs within schools. Consequently, school choice cannot be separated from parental involvement.

The data on charter schools covered in this initial report lead us to conclude that the low achievement scores, low attendance rates in secon-dary grades, and low graduation rates of some charter schools will pose a challenge to their sponsoring agencies. These agencies are charged with the responsibility of reviewing the charter school's performance at least every three years as part of the charter renewal process. The charter school legislation makes clear that the review is to be results-oriented, and advises, "A charter school must design its program to at least meet the outcomes adopted by the state Board of Education for public school students" (Minnesota Statute 120.064, Subdivision 10 [1997]).

Although charter schools vary in their missions, the composition of their student bodies, and their outcomes, their collective performance was generally below that of other public schools. Table 4.3 shows lower attendance in charter schools at eighth and twelfth grade. Although the

MINNESOTA'S PROFILE OF LEARNING PERFORMANCE PACKAGES: A SNAPSHOT FROM BRAINERD, MINNESOTA

Students use trigonometric equations, spreadsheets, and graphs to demonstrate their ability to relate real-world situations and mathematical models. Don Karlgaard, a high school math teacher in Brainerd, facilitates this process by using Biorhythms, a performance task he authored to meet a portion of the Algebraic Patterns content standard.

Students prepare for this performance task by studying mathematical functions and trigonometry. Mr. Karlgaard and his students refer to the Biorhythms performance assessment checklist throughout their study of trigonometry to clarify content and performance expectations. In addition, Mr. Karlgaard instructs students in the use of spreadsheets and graphing calculators.

Biorhythm Overview

At the end of the 19th century, a German physician named Wilhelm Fleiss tried to establish a mathematical relationship between an individual's date of birth and the date of death and/or illnesses. Since then, others have expanded and adjusted the original idea, and the concept is now known as "biorhythm."

According to this idea, there are three biological patterns that begin at birth and affect disposition during the course of a lifetime. These patterns do not determine what will happen on a particular day, only how the individual is likely to feel as events occur. There is a physical cycle with a 23-day period, an emotional cycle with a 28-day period, and an intellectual cycle with a 33-day period.

On your date of birth, each pattern starts at zero and begins to rise in a positive phase, during which the energies and abilities associated with the cycle are high. Then, gradually declining, the patterns cross the zero point midway through their complete periods, and continue into a negative phase in which capabilities are low. Then, increasing amounts of energy are picked up as the negative phase turns upward until, at the end of the patterns, the zero point is recrossed into the positive phase, and the cycle begins again. (Original description credited to Robert Andre, Waianae, Hawaii, in *Minnesota Mathematics Magazine*, Winter, 1995.)

After this brief overview, students are assigned research on biorhythms, specifically, how to analyze and interpret results. When the assignment is completed, Mr. Karlgaard leads the class in a discussion of the best methods and procedures used for data analysis and interpretation. After students have had time to process this information, Mr. Karlgaard assigns the Biorhythm performance task.

number of students on which the dropout figures are based is small, Table 4.4 shows low completion and high dropout rates for these schools. The achievement levels shown in Chapter 5 are generally below those of other public schools.

To some extent, these outcome figures for charter schools are understandable in light of the large percentage of students new to the schools, the high percentage of students of poverty (eligible for free and reduced lunch), and the high percentage of students with disabilities as seen in Tables 5.7 - 5.13.

Nevertheless, in the charter renewal process, chartering agencies should carefully review outcome data for each school on a case-by-case basis. The review should by no means be limited to the kinds of input, process, and outcome information covered by this report. For charter schools whose programs terminate prior to twelfth grade, charter school students will need to transfer prior to completion of high school. The charter renewal process should consider any needs created by such transfers.

Educational Equity

Equity can be defined in various ways. It can be defined as equality of opportunity or equality of outcome. Equity can be defined in terms of gender, ethnicity, economic status, or disability status. In this section, we focus on gender and ethnicity.

Gender

On the outcomes covered in this report, differences by gender do not consistently favor boys or girls. For the most part, the third, fifth, and eighth grade boys had achievement levels at least as high as girls on the mathematics tests covered in this report. In our opinion, these differences in mathematics achievement are small.

In third, fifth, and eighth grades, achievement differences on the reading tests consistently favor girls. In our opinion, these differences are also small. The largest difference is on the fifth grade writing test, and by virtue of its size, is the male/female difference of most concern. Girls graduate from high school at higher rates than boys. The most recent high school follow-up survey suggests that, in contrast to historical trends, girls also progress to two- and four-year colleges at rates comparable to boys. Indeed, this latter result is a major success attributable, in part, to past decades of gender equity initiatives in schools.

The large differences among various ethnic groups in reading, writing, and mathematics across all grades are incompatible with society's diverse goals and with our state's drive toward higher standards for all students. Any approach toward addressing the inequity of achievement among Minnesota's minority students must take into account various factors: lower attendance, higher rates of poverty, greater mobility, and higher proportions of students with disabilities, and limited English proficiency.

Ethnicity

Ethnic diversity has been a major theme of our society and of our schools for decades. As a percentage of total enrollment, minority children will continue to increase. The breadth and scope of ethnic differences in graduation rates and achievement is simply intolerable. So long as such pervasive differences exist, society is unlikely to achieve its diversity goals. But responsibility for the differences cannot be laid solely at the feet of schools. It will take a genuine family-school-community partnership to address the problems faced by minority children and their schools. And if it is a true partnership, each partner—the schools, families, and the community—must accept and be willing to be accountable for its share of the responsibility.

Minority students more commonly live in conditions of poverty. Many of them have limited English proficiency that must be addressed through English language instruction. Tables 5.7 - 5.13 show that minority students taking the achievement tests are far more likely to be new to their district than are Minnesota students generally. We must attempt to reduce the mobility of minority students and minimize the educational disruptions caused by such mobility. Schools need the assistance of parents in reducing mobility, particularly midyear transfers between schools and districts.

In terms of participation outcomes, attendance rates for minority students are lower than for the state as a whole, particularly in the secondary grades. The attendance rates of Native American students are particularly alarming, because they are low in the elementary grades and fall off more sharply than that of other groups in the secondary grades. Attendance is another area where families and communities must assist the schools.

Minority students also experience higher dropout rates and lower four-year high school graduation rates. Census data suggest that many black Minnesotans may be acquiring a high school diploma outside the traditional four-year time span or acquiring a high school equivalency degree after dropping out. Based on these and other findings, it would seem that we need to track some students beyond four years, and bring the adult basic education programs into the accountability and public reporting system to better understand the attainment of a high school education by some students.

Among college-bound students who

took the ACT college admissions test, fewer minority students had taken the core academic course preparation: four years of English, three of mathematics, three of science, and three of social studies. Parents, teachers, and counselors need to encourage post-secondary education, but also adequate high school preparation consistent with the student's post-secondary plans.

Ethnic differences are equally pervasive in the achievement data. They appear in the youngest grade covered by this report, third grade. They extend through the fifth and eight grades, through all subject areas tested, and into the ACT college admissions data. For students with limited English proficiency, English language instruction will be a key. For others, early educational interventions will be critical. But there is no simple solution. As we turn to a consideration of excellence, it is clear that excellence, at least as measured by the indicators of this report, is by no means equitably distributed across ethnic groups in Minnesota's society. These inequalities pose a major societal challenge.

EXCELLENCE

In the report above, we have treated other states and nations as benchmarks against which to judge the performance of Minnesota students. Good data are available only in reading, mathematics, and science. Even in these areas, data are available only for selected grades, and none above grade eight.

The International Reading Literacy Study found that only one country had a mean score significantly greater than that of the United States (U.S. Department of Education, 1996). This finding held at both fourth and eighth grade. While this study contained no direct comparison of Minnesota students to those of other countries, the National Assessment of Educational Progress (Campbell, Donahue, Reese, & Phillips, 1996) has reported that Minnesota fourth graders scored well above the US average in reading, and no state had a mean significantly above that of Minnesota. Combining the national and international data, it seems most

MATH APPLICATIONS *(cont'd from p. 49)*

Students are required to:

- **Develop a mathematical model to illustrate and investigate Fliess' idea, using their birth dates.**
- **Develop trigonometric equations to model all three patterns.**
- **Create a spreadsheet to calculate values for graphing the cycles for the last month and the next two months.**
- **Use the graph to communicate relationships between the cycles and their recollection of good and bad experiences last month.**
- **Use the graphs to predict high and low times for the upcoming two months.**

Mr. Karlgaard uses this task in place of his regular trigonometry test and gives students approximately one week to complete the assignment. The High Standards, explains Mr. Karlgaard, provide students with the "big picture," an opportunity to apply what they have learned at substantially different levels than what is required of them on a regular paper and pencil test. Mr Karlgaard believes that students understand and learn more when they see and make connections between mathematics and real-life situations.

The following is an excerpt from a student's Biorhythm project calculations.

FIND THE NUMBER OF DAYS OLD YOU WERE AT THE END OF 1997:

Birthday: December 6, 1981

TOTAL DAYS ALIVE:				***CHECK:***	
1981	25	1989	365	365	
1982	365	1990	365	x 16	age
1983	365	1991	365	5840	
1984	366	1992	366		
1985	365	1993	365	5840	
1986	365	1994	365	+ 4	leap years in 16 yrs.
1987	365	1995	365	5844	
1988	366	1996	366		
		1997	365	5844	
				+ 25	days older than 16 yrs.
		TOTAL: 5869		5869	***TOTAL***

(cont'd on p. 52)

reasonable to conclude that the reading of Minnesota's fourth-grade students is competitive with that of even the best nations around the world and the highest scoring states within the United States.

Thanks to Minnesota's participation in SciMath[MN] (1997–98), we have a direct comparison of Minnesota students with those of other countries in mathematics and science. At both fourth and eighth grade, six other countries had mean scores significantly above the mean for Minnesota students. While the mathematics achievement of Minnesota fourth and eighth graders has compared very favorably to that of other states in the National Assessment of Educational Progress, the achievement levels are less impressive when benchmarked against the performance of students in other countries. A re-analysis of our mathematics curriculum seems warranted,

MATH APPLICATIONS *(cont'd from p. 51)*

Students used the days in each biological cycle and their total number of days alive to develop the equations for their biological patterns. Each student has a unique Biorhythm graph.

The following excerpt was taken from a student's interpretation of the Biorhythm graph (below).

Prediction

Using the Biorhythm graph, I will be able to determine a positive or negative relationship between the biological patterns and the good or bad days that I have had.

Physical

At the beginning of January, I remember being very tired. In fact, I could not keep my eyes open in class. What I found interesting was that the Biorhythm graph also indicated a low physical cycle around this time. Toward the beginning of February, I should be full of energy according to my physical biorhythm graph. I can also predict that around March 15th I will have a very high physical energy level.

Emotional

During the beginning of January my Biorhythm graph indicated that I would feel emotionally low. This, however, was very inaccurate. My emotions were very high during this part of the month; I could not have been happier. Looking ahead, I should expect to reach emotional highs around the 20th of February and March. I should have emotional lows around February 8th and March 6th.

Intellectual

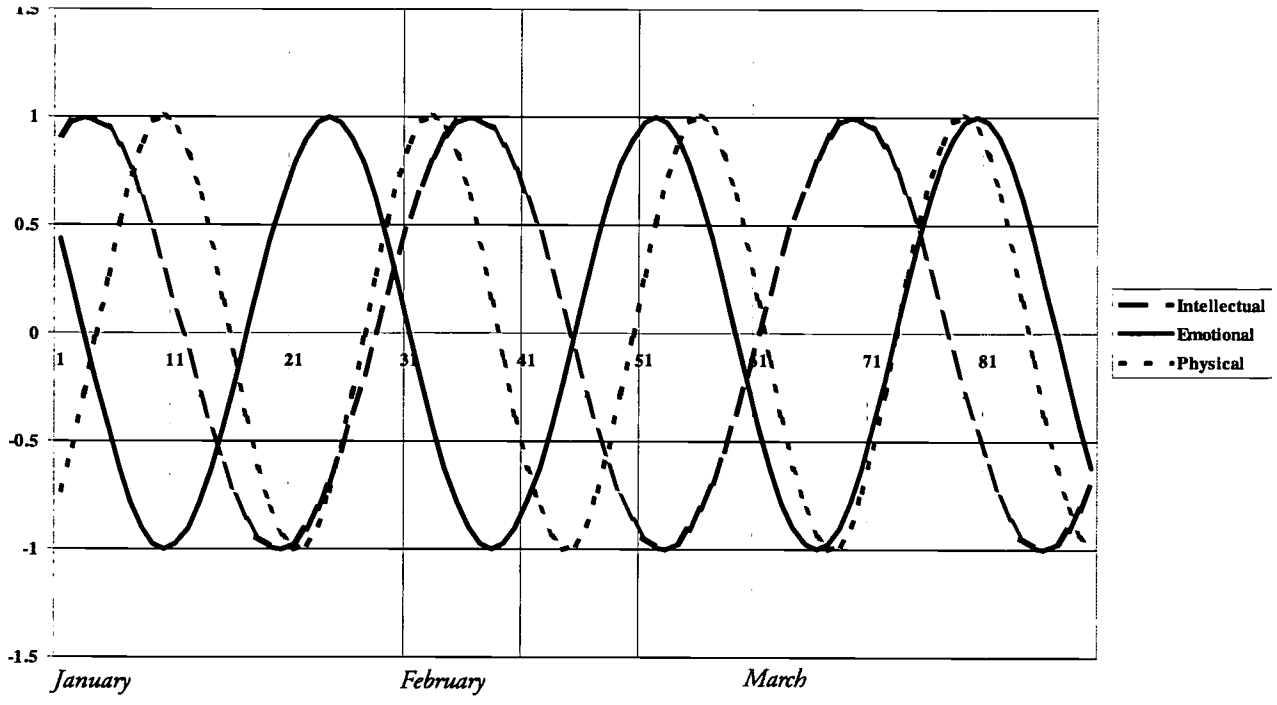
My intellectual biorhythm seems to fit how I was feeling in January. I did not feel very intellectually "with it." I should reach a higher intellectual level around February 5th and March 8th. And, I should have an intellectual low point around the 22nd of February and March.

Evaluation

Students were evaluated on a 3-point scale: E – excellent, S – satisfactory, or N – needs improvement for each criterion on the biorhythm checklist. Since the completion of this project, the scale for evaluating tasks has been changed to a 2-point scale: Y (yes) – has met the performance task or N (no) – has not met the performance task. The performance criteria are listed below:

- **Mathematical equations:** incorporate correct calculations.
- **Trigonometric equations:** are appropriate translations of biorhythmic patterns.
- **Spreadsheet and graph:** show evidence of appropriate mathematical procedures.
- **Communication:** clearly shows connection of the mathematics of the task to your life.

Once the student has completed all the performance tasks required in the content standard (Math Applications) they will be evaluated on the four-point scale developed by the Department of Children, Families and Learning.



particularly in seventh and eighth grades.

In science, as in reading, achievement levels seem high. At fourth grade, only Korea had a mean score significantly above that of Minnesota. At eighth grade, only Singapore's students had a mean score significantly higher than that of Minnesota students. In the last National Assessment of Educational Progress, two states had scores significantly higher than Minnesota, Maine and North Dakota. In fourth and eighth grade science, Minnesota student achievement seems to rank near that of the best countries in the world and close to that of the top performing states within the United States.

Given that fifteen years have now elapsed since *A Nation at Risk*, where do we now stand on three of the issues fueling the call for educational reform, the three most directly addressed by this report?

- **National reports of declines in educational achievement**

Clearly the decline in college admissions test scores on the ACT, the most frequently administered college admissions test, has been arrested. Scores have been climbing during the 1990s, even as more students are taking the exams. More college bound students are completing a core academic curriculum. On the *National Assessment of Educational Progress* (NAEP), mathematics scores have increased over the three administrations during the 1990s. Reading scores declined between 1992 and 1994, but this decline involves only two data points early in the decade. Given the increased emphasis on reading in the *Graduation Standards*, we should forego conclusions until the 1998 NAEP results are in. Further evidence concerning declines or increases in achievement will come from comparing future performance on the MCA and BST against this year's baselines.

- **Reports that American students' mathematics and science achievement test scores are lower than those of students from other industrialized countries**

Sadly, data on Minnesota students (as distinct from American students generally) are lacking above eighth grade. In fourth and eighth grade science, only one country at each grade clearly scored above Minnesota students. We conclude that the achievement of Minnesota students is competitive with all but one participating country. In mathematics, six countries clearly performed better than Minnesota students, while about a dozen were clearly lower. This performance is not up to Minnesota's high ambitions in mathematics. Like SciMath^{MN}, we call for continued reform of curriculum and instructional methods in this area. A good place to start is with the evaluations of the U.S. curriculum arising from the SciMath^{MN} (1997–98) study.

- **Educational equity for female, minority, and disadvantaged students**

On the array of outcomes examined in this report, there is no consistent pattern of lower performance for males or females. Female performance was lower on some outcomes, such as the eighth grade *Basic Standards Test* in mathematics, but such lower performances by females were counterbalanced by higher scores on other indicators, such as the *Basic Standards Test* in reading. The increased proportion of females attending two- and four-year undergraduate programs is one of the decade's educational success stories.

Large differences in achievement, high school course-taking patterns, and graduation rates remain among Minnesota's ethnic and racial groups. These differences are incompatible with our shared vision of a diverse society. The responsibility, however, cannot be laid solely at the feet of schools. Addressing the problem will require a concerted effort by schools, students, parents, and the wider community.

Looking back over the past two decades of educational reform, one can see clear progress in ACT scores, in the course preparation of college bound students, and in the undergraduate higher education participation of females.

Conclusion

From the available data, we conclude that Minnesota students achieve at high levels in reading and science when benchmarked against other states or other countries. In mathematics, they perform at high levels when benchmarked against other states, but at more modest levels as compared to other countries.

Within this overall high level of performance, however, not all groups of students are scoring well, or graduating at acceptable rates. Statewide test scores leave room for improvement at all grades tested. This year's achievement scores provide the baseline from which that improvement will be gauged.

APPENDIX A

MINNESOTA COMPREHENSIVE ASSESSMENTS AND BASIC STANDARDS TESTS WITH RESULTS BROKEN OUT BY CATEGORY

Table A.1 ***1998 Grade 3:*** **Minnesota *Comprehensive Assessment Results in Reading for all Public School Students* Tested Except those with Limited English Proficiency**

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	57277	37	80	1419	94	11	10	29
Girls	28277	42	84	1444	94	8	10	30
Boys	28939	32	76	1396	93	15	10	29
Asian	1096	36	80	1424	95	5	16	40
Black	3538	11	46	1266	91	15	16	82
Hispanic	921	24	71	1363	91	11	18	58
American Indian	1200	15	56	1303	89	18	17	75
White	50410	40	83	1434	94	11	9	24
Special Ed	6534	13	42	1251	82	—	10	43
Metro Area	30066	39	80	1425	94	10	10	26
Outstate	27040	34	80	1413	94	12	11	36
Mpls/St. Paul	5879	23	59	1330	91	11	11	63
TC Suburbs	24187	43	85	1448	94	10	9	17
Outstate: 2000+	13222	35	80	1414	93	13	8	30
Outstate: 2000 -	13818	34	80	1413	94	12	11	36
Public/Charter	229	26	57	1362	82	11	63	61
Public/Not Charter	57048	37	80	1420	94	11	10	29

Table A.2 ***1998 Grade 3:*** **Minnesota *Comprehensive Assessment Results in Reading for all Public School Students Tested Except those New to Their District Since January 1, 1997***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% F/R Students in Score
Total	53996	36	78	1415	94	4	11	30
Girls	26635	41	83	1440	95	4	7	30
Boys	27305	31	74	1391	93	4	15	30
Asian	2488	16	52	1304	93	63	6	70
Black	3081	11	46	1263	91	4	15	82
Hispanic	1212	17	56	1306	88	38	11	68
American Indian	998	16	56	1306	89	0+	17	74
White	46176	40	83	1436	95	0+	11	22
Special Ed	6045	13	42	1251	83	3	—	42
LEP	2166	5	35	1227	89	—	7	87
Metro Area	29031	38	77	1416	94	7	10	28
Outstate	24821	34	80	1413	94	2	12	32
Mpls/St. Paul	6769	19	52	1303	91	23	10	69
TC Suburbs	22262	43	85	1450	95	2	10	15
Outstate: 2000+	12434	34	79	1412	94	2	12	30
Outstate: 2000 -	12387	34	80	1414	95	1	12	35
Public/Charter	111	15	41	1259	79	23	19	66
Public/Not Charter	53885	36	78	1415	94	4	11	30

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.3

1998 Grade 3: **Minnesota Comprehensive Assessment** ***Results in Reading for all Public School Students Tested Except those in Special Education***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% of Enrolled Students Tested	% LEP Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	53193	38	82	1431	95	5	10	30
Girls	27318	43	95	1450	95	4	10	31
Boys	25819	34	79	1412	95	5	10	30
Asian	2698	17	53	1308	94	62	13	70
Black	3159	12	51	1287	93	5	17	81
Hispanic	1331	17	59	1317	88	39	17	70
American Indian	1165	15	58	1329	90	0+	17	74
White	44925	43	87	1455	96	0+	9	22
LEP	2450	5	35	1229	87	—	14	87
Metro Area	28957	39	81	1430	95	7	10	29
Outstate	24088	37	84	1433	95	2	10	32
Mpls/St. Paul	6871	20	55	1316	93	24	11	69
TC Suburbs	22086	45	88	1466	95	2	8	16
Outstate: 2000+	11877	37	84	1432	95	3	8	30
Outstate: 2000 -	12211	37	84	1433	96	1	11	34
Public/Charter	234	24	56	1327	85	12	62	64
Public/Not Charter	52959	38	82	1432	95	5	10	30
Non-public	1315	43	88	1455	—	—	—	—

Table A.4

1998 Grade 3: **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested Except those with Limited English Proficiency***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	57261	37	84	1412	94	12	10	29
Girls	28177	36	84	1408	94	8	10	30
Boys	29012	38	84	1417	93	15	10	29
Asian	1086	37	84	1423	94	5	16	40
Black	3513	8	48	1202	91	15	16	82
Hispanic	926	21	73	1325	90	11	18	58
American Indian	1188	16	67	1292	88	19	17	75
White	50342	40	87	1432	94	11	9	24
Special Ed	6576	15	56	1250	83	—	10	43
Metro Area	30041	39	84	1420	94	11	10	26
Outstate	27045	34	85	1404	94	13	10	33
Mpls/St. Paul	5862	24	63	1303	91	11	11	63
TC Suburbs	24179	43	89	1448	94	10	9	17
Outstate: 2000+	13162	34	85	1403	93	13	8	30
Outstate: 2000 -	13883	34	85	1406	91	13	11	36
Public/Charter	256	22	61	1279	91	13	60	61
Public/Not Charter	57005	37	84	1413	94	12	9	29

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.5 ***1998 Grade 3:*** **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested Except Those New to Their District Since January 1, 1997***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% F/R Students in Score
Total	53979	36	83	1408	94	4	11	30
Girls	26559	35	83	1404	94	4	7	30
Boys	27344	37	84	1413	94	4	15	29
Asian	2457	20	65	1303	92	63	6	70
Black	3063	9	48	1203	91	4	15	82
Hispanic	1209	15	60	1264	88	37	11	68
American Indian	989	17	67	1293	89	0+	18	74
White	46130	40	88	1435	95	0+	11	22
Special Ed	6082	15	56	1250	84	3	—	42
LEP	2253	7	49	1208	89	—	7	87
Metro Area	29004	38	82	1412	94	7	10	7
Outstate	24831	34	85	1404	94	2	12	2
Mpls/St Paul	6746	20	60	1284	91	23	10	69
TC Suburbs	22258	44	89	1451	95	2	10	15
Outstate 2000+	12382	33	84	1401	93	2	12	30
Outstate 2000-	12449	34	85	1407	95	1	13	34
Public/Charter	127	17	55	1244	91	20	21	20
Public/Not Charter	53852	36	83	1409	94	4	11	4

Table A.6 ***1998 Grade 3:*** **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested Except Those in Special Education***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	53123	38	86	1423	95	5	10	30
Girls	27232	36	85	1414	95	4	10	31
Boys	25831	40	87	1433	95	5	10	29
Asian	2670	20	66	1308	93	62	13	70
Black	3149	9	52	1220	92	5	17	81
Hispanic	1322	15	62	1274	87	38	19	69
American Indian	974	18	72	1317	90	0+	17	74
White	44886	42	91	1451	96	0+	9	22
LEP	2438	7	50	1211	87	—	14	87
Metro Area	28912	40	84	1424	95	7	10	29
Outstate	24063	36	88	1422	95	2	10	32
Mpls/St. Paul	6833	21	63	1296	92	24	11	69
TC Suburbs	22079	45	91	1463	95	2	10	16
Outstate: 2000+	11829	36	87	1418	94	3	8	29
Outstate: 2000 -	12234	37	89	1425	96	1	11	34
Public/Charter	252	21	61	1285	91	11	60	60
Public/Not Charter	52871	38	86	1424	95	5	10	30

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.7 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment** ***Results in Reading for all Public School Students Tested Except Those with Limited English Proficiency***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	57672	40	81	1429	95	13	9	27
Girls	28234	44	85	1453	96	8	9	27
Boys	29417	35	78	1405	95	18	9	27
Asian	1340	41	84	1445	97	6	12	38
Black	3141	14	47	1258	94	20	16	77
Hispanic	861	23	68	1350	93	17	17	55
American Indian	1162	15	58	1293	90	21	13	73
White	50959	42	84	1443	96	13	8	22
Special Ed	7535	12	42	1235	89	—	9	41
Metro Area	29443	42	81	1438	96	13	9	24
Outstate	27952	37	81	1419	95	14	8	31
Mpls/St. Paul	5422	26	61	1333	94	16	11	61
TC Suburbs	24021	46	86	1461	96	12	8	15
Outstate: 2000+	13612	38	82	1425	95	14	8	27
Outstate: 2000 -	14340	36	80	1414	96	14	9	34
Public/Charter	188	31	65	1357	94	22	59	51
Public/Not Charter	57484	40	81	1429	95	13	8	27

Table A.8 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment** ***Results in Reading for all Public School Students Tested Except Those New to Their District Since January 1, 1997***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% of Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% F/R Students in Score
Total	54605	39	80	1425	96	3	13	27
Girls	26650	44	84	1450	96	3	8	27
Boys	27936	35	77	1401	95	4	17	28
Asian	2489	23	59	1327	97	52	9	65
Black	2743	14	47	1257	94	4	20	77
Hispanic	1080	18	56	1298	94	34	17	64
American Indian	1012	16	58	1296	91	0+	21	71
White	47149	43	84	1446	96	0+	13	21
Special Ed	7073	13	42	1235	90	3	—	41
LEP	1881	4	34	1206	96	—	13	89
Metro Area	28413	41	80	1430	96	5	13	25
Outstate	25959	37	81	1419	95	1	13	30
Mpls/St. Paul	6122	22	55	1307	95	21	15	67
TC Suburbs	22291	46	86	1464	96	1	12	14
Outstate: 2000+	12856	38	81	1423	95	2	14	27
Outstate: 2000 -	13103	36	81	1416	96	1	13	33
Public/Charter	101	28	55	1308	94	23	32	43
Public/Not Charter	54504	39	80	1425	96	3	13	27

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.9 *1998 Grade 5:* **Minnesota Comprehensive Assessment** ***Results in Reading for all Public School Students Tested Except Those in Special Education***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% of Enrolled Students Tested	% LEP Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	52032	42	85	1449	96	4	9	27
Girls	26729	46	87	1465	97	3	9	28
Boys	25279	39	83	1432	96	4	9	27
Asian	2555	23	62	1337	97	51	11	65
Black	2624	16	54	1291	95	5	17	76
Hispanic	1080	19	61	1319	91	34	17	66
American Indian	922	18	67	1331	93	0+	13	72
White	44678	46	89	1470	97	0+	8	21
LEP	1895	5	37	1217	93	—	14	8
Metro Area	27331	44	84	1452	96	6	9	26
Outstate	24490	40	86	1445	96	1	8	29
Mpls/St. Paul	5817	24	61	1336	96	22	10	66
TC Suburbs	21514	49	90	1483	97	1	9	15
Outstate 2000+	12010	42	87	1449	96	2	7	26
Outstate 2000 -	12480	39	86	1441	96	1	9	32
Public/Charter	164	35	70	1385	94	10	58	52
Public/Not Charter	51868	42	85	1449	96	4	9	27

Table A.10 *1998 Grade 5:* **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested Except Those with Limited English Proficiency***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	57528	32	81	1403	95	13	9	27
Girls	28063	31	81	1400	96	9	9	27
Boys	29440	33	81	1406	95	17	9	27
Asian	1331	34	83	1416	96	7	12	39
Black	3104	7	42	1215	93	20	16	77
Hispanic	855	16	65	1314	92	17	17	54
American Indian	1154	10	55	1273	90	21	14	73
White	50879	35	85	1419	96	13	8	22
Special Ed	7529	11	48	1246	89	—	9	41
Metro Area	29280	36	82	1414	95	13	9	24
Outstate	27972	29	81	1393	95	14	8	31
Mpls/St. Paul	5367	20	59	1306	93	16	10	61
TC Suburbs	23913	39	87	1438	95	12	8	15
Outstate: 2000+	13586	30	82	1398	94	14	7	27
Outstate: 2000 -	14386	28	80	1387	96	13	9	34
Public/Charter	189	21	65	1315	94	21	58	51
Public/Not Charter	57339	32	81	1404	95	13	8	27

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.11 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested Except Those New to Their District Since January 1, 1997***

Category	Number Tested	%At or Above Level III	%At or Above Level II	Mean Scale Score	%Enrolled Students Tested	%LEP Students in Score	%Special Ed Students in Score	%F/R Students in Score
Total	54502	32	81	1401	95	3	13	27
Girls	26509	31	81	1399	96	3	8	27
Boys	27971	33	81	1403	95	4	17	27
Asian	2486	19	64	1318	97	53	9	65
Black	2712	7	42	1217	93	3	20	77
Hispanic	1075	12	54	1270	93	34	17	64
American Indian	939	57	57	1278	90	0+	20	72
White	47099	35	85	1422	96	0+	13	21
Special Ed	7070	11	49	1248	90	3	—	40
LEP	1877	4	41	1211	96	—	13	89
Metro Area	28276	35	80	1409	95	5	13	25
Outstate	25993	29	81	1393	96	1	13	30
Mpls/St. Paul	6077	17	56	1289	94	21	15	67
TC Suburbs	22199	40	87	1441	96	1	12	13
Outstate: 2000+	12843	30	82	1397	95	2	14	27
Outstate: 2000-	13150	28	81	1390	96	1	13	33
Public/Charter	103	17	62	1401	95	23	29	44
Public/Not Charter	54399	32	81	1286	95	3	13	27

Table A.12 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment** ***Results in Mathematics for all Public School Students Tested Except Those in Special Education***

Category	Number Tested	%At or Above Level III	%At or Above Level II	Mean Scale Score	% Enrolled Students Tested	%LEP Students in Score	%New to District Since 1/1/97	%F/R Students in Score
Total	51887	34	85	1419	96	4	9	27
Girls	26546	33	84	1411	96	3	9	28
Boys	25308	36	86	1428	96	4	9	27
Asian	2544	20	65	1326	97	51	11	65
Black	2597	8	47	1238	94	5	17	76
Hispanic	1072	13	57	1285	91	34	17	65
American Indian	919	11	63	1299	92	0+	13	72
White	44589	38	89	1441	96	0+	8	20
LEP	1888	5	43	1218	93	—	14	88
Metro Area	27167	37	84	1424	96	6	9	26
Outstate	24512	32	86	1414	96	1	8	29
Mpls/St. Paul	5769	19	60	1308	95	22	10	66
TC Suburbs	21398	42	90	1456	96	1	9	15
Outstate: 2000+	11981	33	86	1419	95	2	7	26
Outstate: 2000-	12531	31	85	1410	97	1	9	32
Public/Charter	168	23	67	1335	96	11	57	53
Public/Not Charter	51719	34	85	1420	96	4	8	27

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.13 **1998 Grade 5: Minnesota Comprehensive Assessment** ***Results in Writing for all Public School Students Tested Except Those with Limited English Proficiency***

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	57597	43	81	1404	95	13	9	27
Girls	28191	53	88	1506	96	8	9	27
Boys	29385	33	75	1307	95	17	9	27
Asian	1336	50	87	1479	97	7	12	38
Black	3064	21	57	1136	91	20	16	76
Hispanic	858	31	71	1285	92	17	16	55
American Indian	1136	20	61	1145	88	20	13	73
White	50997	45	83	1426	96	12	8	22
Special Ed	7363	15	51	1047	87	—	9	40
Metro Area	29357	46	82	1431	95	12	9	24
Outstate	27967	40	80	1377	95	13	8	30
Mpls/St. Paul	5345	32	67	1257	93	15	10	61
TC Suburbs	24012	49	85	1469	96	12	8	15
Outstate: 2000+	13617	41	80	1385	95	13	7	27
Outstate: 2000 -	14350	39	79	1370	96	13	9	34
Public/Charter	187	34	66	1248	93	20	57	51
Public/Not Charter	57410	43	81	1405	95	13	8	27

Table A.14 **1998 Grade 5: Minnesota Comprehensive Assessment** ***Results in Writing for all Public School Students Tested Except Those New to Their District Since January 1, 1997***

Table A.14

1998 GRADE 5: *Minnesota Comprehensive Assessment* Results in WRITING for all Public School Students Except those New to their District since January 1, 1997

Category	Number Tested	% At or Above Level III	% At or Above Level II	Mean Scale Score	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% F/R Students in Score
Total	54511	43	81	1403	95	3	13	27
Girls	26607	53	88	1505	96	3	8	27
Boys	27886	33	74	1305	95	4	17	27
Asian	2467	35	76	1331	96	52	9	65
Black	2674	22	57	1138	92	3	20	77
Hispanic	1065	25	65	1215	92	33	16	64
American Indian	988	19	61	1150	89	0+	20	71
White	47187	45	83	1431	96	0+	12	21
Special Ed	6909	15	51	1050	87	3	—	40
LEP	1835	24	62	1150	94	—	12	89
Metro Area	28310	45	82	1424	95	5	12	25
Outstate	25971	40	80	1380	96	1	13	30
Mpls/St. Paul	6033	30	6	1237	93	21	15	67
TC Suburbs	22277	50	86	1475	96	1	12	13
Outstate: 2000+	12872	41	80	1384	95	2	13	27
Outstate: 2000-	13099	39	80	1375	96	1	13	33
Public/Charter	102	28	62	1158	94	22	27	45
Public/Not Charter	54409	43	81	1403	95	3	13	27

Note: LEP = Limited English Proficiency ; F/R = Eligible for free or reduced lunch. All percentages and Mean Scale Scores have been rounded to the nearest whole number; "0+" indicates a .49% or less.

Table A.15 ***1998 Grade 5:*** **Minnesota Comprehensive Assessment** ***Results in Writing for all Public School Students Tested Except Those in Special Education***

Category	Number Tested	%At or Above Level III	%At or Above Level II	Mean Scale Score	% Enrolled Students Tested	%LEP Students in Score	%New to District Since 1/1/97	%F/R Students in Score
Total	52078	46	85	1447	96	4	9	27
Girls	26690	55	90	1531	97	3	9	28
Boys	25361	36	79	1358	96	4	9	27
Asian	2526	37	78	1357	96	51	11	64
Black	2571	25	64	1212	93	4	16	76
Hispanic	1063	28	69	1261	90	33	16	65
American Indian	908	24	68	1221	91	0+	13	71
White	44840	49	87	1474	97	0+	8	21
LEP	1844	20	65	1181	91	—	13	88
Metro Area	27273	49	85	1467	96	6	9	26
Outstate	24595	43	84	1424	96	1	8	29
Mpls/St. Paul	5740	33	72	1299	95	21	10	66
TC Suburbs	21533	53	89	1512	97	1	9	15
Outstate: 2000+	12063	44	84	1431	96	2	7	26
Outstate: 2000 -	12532	42	84	1418	97	1	9	32
Public/Charter	168	36	71	1307	96	11	55	54
Public/Not Charter	51910	46	85	1447	96	4	8	27

Table A.16 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Reading for all Public School Students Tested Except Those with Limited English Proficiency***

Category	Number Tested	% Meeting H.S. Standard	Mean Number Correct	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	62824	69	31.43	96	12	7	22
Girls	30419	72	32.01	96	7	7	23
Boys	31595	68	31.03	96	16	17	22
Asian	1768	66	31.05	97	5	10	45
Black	2539	33	24.70	89	24	15	71
Hispanic	912	48	28.04	92	14	17	52
American Indian	1132	38	26.06	88	24	14	64
White	55011	73	32.02	97	11	6	18
Special Ed	7347	28	23.33	88	—	11	40
Metro Area	29875	70	31.54	96	12	7	20
Outstate	32475	69	31.37	96	12	7	26
Mpls/St. Paul	5184	47	27.46	90	18	9	58
TC Suburbs	24691	75	32.39	97	10	6	12
Outstate: 2000+	15867	70	31.48	96	12	6	22
Outstate: 2000 -	16608	68	31.26	97	12	8	29
Public/Charter	180	43	26.19	98	26	46	50
Public/Not Charter	62644	69	31.44	96	12	7	23

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.17 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Reading for all Public School Students Tested Except Those New to Their District Since January 1, 1997***

Category	Number Tested	% Meeting H.S. Standard	Mean Number Correct	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% F/R Students in Score
Total	59732	69	31.38	96	2	11	23
Girls	28949	72	31.96	97	2	6	23
Boys	30098	67	30.98	96	3	15	23
Asian	2507	49	28.09	93	37	7	61
Black	2268	33	24.64	90	5	20	72
Hispanic	1028	42	26.44	90	26	16	60
American Indian	977	39	26.15	90	0+	21	64
White	51660	73	32.14	97	0+	10	18
LEP	1381	16	21.85	86	—	12	89
Special Ed	6449	25	22.84	87	3	—	40
Metro Area	28971	69	31.35	96	4	11	21
Outstate	30485	69	31.44	97	1	11	25
Mpls/St. Paul	5653	42	26.57	90	16	13	63
TC Suburbs	23318	76	32.51	97	1	10	11
Outstate: 2000+	15115	70	31.52	96	1	11	22
Outstate: 2000 -	15370	69	31.35	97	0+	11	28
Public/Charter	100	36	24.99	96	2	25	53
Public/Not Charter	59632	69	31.39	97	2	11	23

Table A.18 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Reading for all Public School Students Tested Except Those in Special Education***

Category	Number Tested	% Meeting H.S. Standard	Mean Number Correct	% of Enrolled Students Tested	% LEP Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	55411	74	32.37	97	2	7	22
Girls	28470	74	32.50	97	2	7	23
Boys	26683	74	32.29	97	3	7	21
Asian	2579	50	28.40	94	35	10	61
Black	2055	38	26.19	92	7	16	70
Hispanic	1061	43	26.92	88	26	19	60
American Indian	857	46	28.03	90	0	13	61
White	48859	78	33.04	98	0	6	16
LEP	1396	17	22.18	85	—	15	89
Metro Area	26919	74	32.27	97	4	7	20
Outstate	28181	74	32.48	98	1	7	24
Mpls/St. Paul	4932	47	27.81	91	18	9	62
TC Suburbs	21987	80	33.27	98	1	6	11
Outstate: 2000+	13805	75	32.51	97	2	6	20
Outstate: 2000 -	14376	74	32.44	98	0	7	27
Public/Charter	98	52	28.59	100	2	47	44
Public/Not Charter	55313	74	32.38	97	2	7	22

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.19 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Mathematics for all Students Tested Except Those with Limited English Proficiency***

Category	Number Tested	% Meeting H.S. Standard	Mean Number Correct	% Enrolled Students Tested	% Special Ed Students in Score	% New to District Since 1/1/97	% F/R Students in Score
Total	62813	72	54.15	96	12	7	23
Girls	30400	71	53.97	97	7	7	23
Boys	31544	74	54.63	96	16	7	22
Asian	1767	69	53.81	97	5	10	45
Black	2547	27	39.13	89	24	15	72
Hispanic	900	46	46.68	91	14	17	52
American Indian	1137	39	44.18	88	24	14	64
White	54963	76	55.39	97	11	6	18
Special Ed	7344	30	39.98	88	—	11	40
Metro Area	29821	72	54.03	96	12	7	20
Outstate	32510	72	54.33	96	12	7	26
Mpls/St. Paul	5192	45	45.44	90	18	9	58
TC Suburbs	24629	77	55.84	97	10	6	12
Outstate: 2000+	15890	73	54.64	96	12	6	22
Outstate: 2000 -	16620	72	54.05	97	12	8	29
Public/Charter	176	40	42.51	96	27	44	50
Public/Not Charter	62637	72	54.18	96	12	7	23

Table A.20 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Mathematics for all Students Tested Except Those New to Their District Since January 1, 1997***

Category	Number Tested	% Meeting H.S. Standard	Mean Number Correct	% Enrolled Students Tested	% LEP Students in Score	% Special Ed Students in Score	% F/R Students in Score
Total	59741	72	54.14	96	2	11	23
Girls	28949	71	53.95	97	2	6	23
Boys	30051	74	54.62	96	3	15	23
Asian	2513	54	48.98	94	37	7	61
Black	2278	28	39.17	91	5	20	73
Hispanic	1016	41	44.18	89	26	16	60
American Indian	978	41	44.74	90	0+	21	64
White	51629	77	55.62	97	0+	10	18
LEP	1385	23	38.23	86	—	12	89
Special Ed	6456	28	39.15	82	3	—	40
Metro Area	28941	71	53.81	96	4	11	21
Outstate	30517	73	54.49	97	1	11	25
Mpls/St. Paul	5673	42	44.26	90	16	13	63
TC Suburbs	23268	78	56.14	97	1	10	11
Outstate: 2000+	15141	74	54.76	96	1	11	22
Outstate: 2000 -	15376	72	54.23	97	0+	11	28
Public/Charter	100	35	40.59	97	2	25	53
Public/Not Charter	59641	72	54.16	96	2	11	23

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

Table A.21 ***1998 Grade 8:*** **Basic Standards Test** ***Results in Mathematics for all Students Tested Except Those in Special Education***

Category	Number Tested	% Meeting H.S. Standard	Mean Number Correct	% of Enrolled Students Tested	% LEP Students in Score	% New to District Since 1/1/9	% F/R Students in Score
Total	55375	77	55.85	97	3	7	22
Girls	28461	74	54.97	97	2	7	23
Boys	26657	81	56.89	97	3	7	21
Asian	2582	56	49.77	94	35	10	61
Black	2069	32	41.60	92	7	16	69
Hispanic	1053	42	45.64	88	27	19	60
American Indian	863	48	47.82	91	0+	14	61
White	48808	81	57.14	98	0+	6	17
LEP	1405	25	39.26	86	—	16	89
Mtro Area	26871	75	55.42	97	4	7	20
Outstate	28193	78	56.27	98	1	7	24
Metro Area	4947	47	46.54	91	18	9	62
TC Suburbs	21924	82	57.43	98	1	6	11
Outstate: 2000+	13815	79	56.48	97	2	6	20
Outstate: 2000-	14378	78	56.06	98	0+	7	27
Public/Charter	94	49	45.94	96	2	46	44
Public/Not Charter	55281	77	55.87	97	3	7	22

Note: LEP=Limited English Proficiency; F/R=Eligible for free or reduced-price lunch; 0+ indicates a .4% or less. All percentages and Mean Scale Scores are rounded to the nearest whole number.

APPENDIX B
CONTENT AND PERFORMANCE STANDARDS

HOW TO OBTAIN MORE INFORMATION ON CONTENT (CURRICULA) AND PERFORMANCE STANDARDS

NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS (NCTM)	The National Council of Teachers of Mathematics sets content standards for mathematics in their 1989 publication *Curriculum and Evaluation Standards for School Mathematics*. This publication details the mathematics content a student should know and be able to demonstrate. A revision of these standards is due October 1998. This will be a draft and is free to NCTM members and will be available to non-members for a nominal fee for shipping and handling, $7.50. You may order the standards online (http://www.nctm.org/standards2000), by telephone (888-220-7952 or 703-620-9840 ext. 2103), by fax (703-476-2970), by email (standards2000-draft@nctm.org), or by mail (NCTM / Drawer A / 1906 Association Drive / Reston, VA 20191-1593 / Attn: Standards 2000).
NATIONAL COUNCIL OF TEACHERS OF ENGLISH (NCTE)	The National Council of Teachers of English and the International Reading Association (http://www.ira.org) set content standards for English in their 1996 publication, *Standards for the English Language Arts*. The cost of the publication is $13.00 to members and $18.00 to nonmembers. NCTE can be reached online (http://www.ncte.org/standards), by telephone (800-369-6283 or 217-328-3870), by fax (217-328-9645), by email (standards@ncte.org), or by mail (NCTE / 1111 West Kenyon Road / Urbana, IL 61801).
NATIONAL RESEARCH COUNCIL	The National Research Council, an arm of the National Academy of Science created standards in science. These standards have been adopted and promoted by the National Science Teachers Association (http://www.nsta.org). The 1996 publication, *National Science Education Standards*, is available for $19.95 (prepaid) plus $4.00 shipping and handling ($0.50 more for each additional copy). Discounts apply for multiple orders. Orders can be sent to the National Academy Press by telephone (202-334-3313 or 800-624-6242), by mail (National Academy Press / 2101 Constitution Avenue, NW / Washington, DC 20418), or online (http://www.nap.edu/bookstore). Note that books ordered online merit a 20% discount.
NATIONAL COUNCIL FOR THE SOCIAL STUDIES (NCSS)	The National Council for the Social Studies developed social studies standards in 1994. Their publication, *Expectation of Excellence: Curriculum Standards for Social Studies*, is available at $15.00 to non-members and $12.75 to members. There is a $4 charge for shipping and handling. There are multiple copy discounts. To order the publication you can contact NCSS by telephone (800-683-0812), by fax (301-843-0159), by mail (NCSS Publications / P.O. Box 2067 / Waldorf, Maryland 20604-2067), or online (http://www.ncss.org/bookstore/standards.html).
NATIONAL CENTER FOR HISTORY IN THE SCHOOLS	There is also a set of standards for history (both United States history and world history). The National Center for History in the Schools (http://www.sscnet.ucla.edu/nchs) originated the standards in 1994 and subsequently revised then in 1996. The standards are $15.95 for nonmembers and $15 for members. To order the standards contact the UCLA Store which can be accessed by telephone (310-206-0788), by fax (310-825-0382), by mail

Center for Civic Education

(UCLA Book Zone / 308 Westwood Plaza / Ackerman Union / Los Angeles, CA 90024-1645), or by e-mail at: (bookorder@asucla.ucla.edu). Note that these standards can also be ordered via NCSS's online bookstore (http://www.ncss.org/bookstore/standards.html).

National Council for Geographic Education

Civics and government also have a set of standards. These were created by the Center for Civic Education. The publication is entitled *National Standards for Civics and Government.* For 1 – 9 copies the publication is $14.00 each. If you order 10 or more copies, the cost goes to $12.00 per book. The Center for Civic Education can be contacted by phone (818-591-9321), fax (818-591-9330), e-mail (center4civ@aol.com), mail (Center for Civic Education / 5146 Douglas Fir Rd. / Calabasas, CA 91302-1467), or online (http://www.civiced.org). Note that these standards can also be ordered via NCSS's online bookstore (http://www.ncss.org/bookstore/standards.html).

American Council on the Teaching of Foreign Languages (ACTFL)

Geography for Life: The National Geography Standards are available from the National Council for Geographic Education. Single copies are available for $7 each with a $2.50 charge for shipping and handling for the first book. There are multiple copy discounts on books and shipping and handling. NCGE can be contacted by mail (National Council for Geographic Education / Leonard 16A / Indiana University of Pennsylvania / Indiana PA 15705), by telephone (724-357-6290), by email (NCGE-ORG@grove.iup.edu), or online (http://www.ncge.org). Note that these standards can also be ordered via NCSS's online bookstore, (http://www.ncss.org/bookstore/standards.html).

Consortium of National Arts Education Associations

The American Alliance for Theatre & Education
The Music Educators National Conference
The National Art Education Association
The National Dance Association.

The American Council on the Teaching of Foreign Languages (http://www.actfl.org), and a host of other organizations developed a set of standards for foreign language. *Standards for Foreign Language Learning: Preparing for the 21st Century.* It is available at $20.00 per copy for less than ten books and $15.00 per copy for ten or more books. These prices include shipping and handling. You can order by telephone (800-627-0629 or 913-843-1221), by fax (913-843-1274), or by mail (National Standards Report / P.O. Box 1897 / Lawrence, KS 66044)

The Arts Standards were developed by the Consortium of National Arts Education Associations (http://artsedge.kennedy-center.org/cs/design/standards) which consisted of the American Alliance for Theatre & Education (http://www.aate.com), the Music Educators National Conference (http://www.menc.org), the National Art Education Association (http://www.naea-reston.org), and the National Dance Association (http://www.aahperd.org) . *National Standards for Arts Education: What Every Young American Should Know and Be Able to Do in the Arts,* is available for $20 (nonmembers) or $16 (members) and can be ordered from MENC by mail (Music Educators National Conference / 1806 Robert Fulton Drive, Reston, VA 20191), by telephone (800-828-0229), by fax (888-275-MENC), or online (http://www.menc.org/publication/books/order.html).

Please Note: *Web addresses and e-mail addresses (contained within parentheses) are underlined in this section. All of the underlined text,* without *the parentheses, should be entered on your computer without spaces between letters or between symbols. For space reasons, we were unable to ensure that all addresses would appear unbroken and on a single line of text. Information and addresses provided in this section were correct when this report went to press.*

APPENDIX C
GLOSSARY OF TERMS

Achievement test	An examination that measures the extent to which a person has acquired certain information or mastered certain skills, usually as a result of specific instruction.
ACT Assessment Program	The ACT assessment program measures educational development and readiness to pursue college-level coursework in English, mathematics, natural science, and social science. Student performance on the tests does not solely reflect innate ability and is influenced by a student's educational preparedness.
ACT core academic courses	These are courses that the ACT Assessment program suggests students complete prior to high school graduation. The courses include: four years of English, three years of science, three years of social studies and three years of mathematics. The English portion of the test consists of punctuation 13%, basic grammar 16% and sentence structure 24%. Rhetorical skills include strategy 16%, organization 15%, and style 16%. The math portion consists of pre-algebra 23%, elementary algebra 17% intermediate algebra 15%, coordinate geometry 15%, plane geometry 23%, and trigonometry 7%. The reading portion consists of passages from social studies 25%, natural sciences 25%, prose fiction 25% and humanities 25%. The science portion consists of data representation 38%, research summary 45%, and conflicting viewpoints 17%. Web site: http://www.act.org/
Administration–Expenditure Category	Expenditures for the school board and for the office of the superintendent, principals, and any other line administrators who supervise staff.
Advanced Placement Programs (AP)	AP gives highly motivated students an opportunity to take college-level courses and exams while still in high school. There are now 32 different AP courses to choose from, in 18 different subject areas, offered by approximately 14,000 high schools worldwide. In 1998, AP reached a milestone — more than a million exams were taken by about half a million students. The College Board administers the exams. AP examination grades are reported on a 5-point scale as follows: 5 – extremely well qualified; 4 – well qualified; 3 – qualified; 2 – possible qualified; 1 – no recommendation. A score of 3 or above will receive college credit or advanced placement. Web site: http://www.collegeboard.org/ap
Assurance of Mastery revenue	Districts that have identified direct instructional services to assure that K-8 pupils master learner outcomes in communications and math are eligible for state aid. Other district revenue must match the state aid. This revenue, along with limited English proficient revenue and assurance of mastery revenue, is included in the targeted need revenue category.
At-risk students	Those students in danger of failing to complete their education with the skills necessary for a modern technological society.
Average Daily Attendance (ADA)	The aggregate attendance of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Only days on which the pupils are under the guidance and direction of teachers should be considered days in session.
Average Daily Membership (ADM)	The aggregate enrollment of a school during a reporting period (normally a school year) divided by the number of days school is in session during this period. Pupils need not be in attendance to be counted in ADM, but they must be in membership.

Bachelor's degree	A degree granted for the successful completion of a baccalaureate program of studies, usually requiring at least 4 years (or equivalent) of full-time college-level study.
Basic standards	These standards represent *one* of the two components of the Minnesota Graduation Rule established in 1992. The Basic Standards represent the minimum skills required for a high school diploma in Minnesota.
Charter Schools	Publicly funded schools that are granted a high degree of autonomy from existing rules and regulations. Depending upon state law, teachers, parents, or other would-be educators can apply for permission to open a school. The "charter" may be granted by, for example, the local school board, the state board of education, or a public institution of higher education, depending upon the state. Some states also allow existing public or nonsectarian private schools to convert to charter status. Charter schools have the potential to control their own budget, staffing and curriculum, but their autonomy varies from state to state. They must attract students and achieve the results agreed to in their charters, or their contracts can be revoked.
Choice options	The school choice options in Minnesota include the Postsecondary Enrollment Option, open enrollment or charter schools.
Class size	The number of students a teacher has in his/her class at a given time.
Compensatory funds (also known as **Compensatory Education Revenue**)	Based on a complex formula which provides additional funding for districts with students eligible to receive free lunch and/or reduced priced lunch based on October 1st enrollments of the previous fiscal year. Compensatory revenue increases as the percent of students eligible for free and reduced lunch increases. The percent is capped, however.
Completion rate	Refers to the percent of students who complete high school in four years.
Content Standards	Content standards define what students should know and be able to do in key academic subjects at specific grades.
Curriculum	A school's master plan for selecting content and organizing learning experiences for the purpose of changing and developing learners' behaviors and insights. A curriculum is characterized by its scope (breadth of content) and sequence (organization of content).
Dropout rate	The percentage of students that leave high school before receiving their diploma. Students who transfer to a non-public high school or to a public high school in another state are <u>not</u> counted as a dropout.
Educational Accountability	Is a systematic method to assure those inside and outside the education system that schools and students are moving toward desired goals. In Minnesota, it is a statewide system that is applicable, with appropriate assessment accommodations, to all students, including those with disabilities and limited proficiency in English.
Educational attainment	The highest grade of regular school attended and completed.
Enrollment	The total number of students registered in a given school unit at a given time, generally in the fall of a year.
Equity	Refers to equal treatment, justice.
Ethnicity	The cultural heritage of a particular group.

Exceptional Instruction–Expenditure Category	Expenditures for instruction of students who, because of atypical characteristics or conditions, are provided educational programs that are different from regular instructional programs. Includes expenditures for special instruction of students who are emotionally or psychologically disabled, or mentally retarded; for students with physical, hearing, speech, and visual impairments; and for students with special learning and behavior problems.
Federal funding	Federal funding is the percentage of revenues from the federal government, whether paid directly or through another governmental unit. It includes all federal appropriations, grants, and contracts received by districts. The funds are typically targeted toward specific minority and disadvantaged student populations.
First grade preparedness funds	For the 1996-97, 1997-98 and 1998-99 school years, certain school sites are eligible for funding to operate full day kindergarten programs or half day programs for four year olds to develop reading and other skills necessary to succeed in school. School sites with the highest concentrations of pupils eligible for free and reduced lunch are eligible for funding. The funding is the amount equal to .53 times pupils enrolled in the program times the general education formula allowance.
Food Support -Expenditure Category	Expenditures for the preparation and serving of meals and snacks to students.
Foundation formula (also known as the General Education Funding Program)	The general education funding program is the method by which school districts receive the majority of their financial support. It is designed to provide a basic foundation of funding for all districts irrespective of local resources. It also channels more state aid to districts with low residential and commercial tax bases.
Free lunch/reduced lunch	The eligibility requirements are based on household size and total household income. Household size includes every child and adult in the household, whether related or unrelated. Every person who shares housing and/or expenses is considered to be part of your household for this purpose. To qualify, a total household income should not exceed the following amounts. Household size to total monthly household income: 1/$1,242; 2/$1,673; 3/$2,105; 4/$2,537; 5/$2,968; 6/$3,400; 7/$3,832; 8/$4,263. For each additional household member add $432. (Application for educational benefits 1998-99, Free or reduced price school meals - State and Federally Funded Programs for Schools)
Full-time-equivalent (FTE)	School staff members are counted using FTE values. For example, a full-time staff member is counted as 1.0 FTE; one employed only half time is counted as .5 FTE.
Graduation rate	For the purposes of this report, graduation rate refers to the proportion of public school ninth graders who graduate from high school four years later. Ninth grade students who transfer to a non-public school or to a public school in another state are excluded from the calculations.
IDEA	Individuals with Disabilities Education Act, the federal law that oversees the provision of a free and appropriate public education to students with disabilities.
IEA	International Association for the Evaluation of Educational Achievement is an independent international cooperative of research centers and departments of education in more than 50 countries.

Instructional alignment	The match between learning goals, learning activities, and assessment. Alignment is critical if teaching is to be effective and learning is to be maximized.
Instructional Support–Expenditure Category	Expenditures for activities intended to help teachers provide instruction, not including expenditures for principals or superintendents. Includes expenditures for assistant principals, curriculum development, libraries, media centers, audiovisual support, staff development, and computer-assisted instruction.
International Baccalaureate (IB)	The International Baccalaureate Diploma Program is a rigorous pre-university course of studies, leading to examinations, that meets the need of highly motivated secondary school students between the ages of 16 and 19 years. Designed as a comprehensive two-year curriculum that allows its graduates to fulfill requirements of various national education systems, the diploma model is based on the pattern of no single country but incorporates the best elements of several. Each examined subject is graded on a scale of 1 (minimum) to 7 (maximum). The award of the diploma requires students to meet defined standards and conditions including a minimum total of 24 points and the satisfactory completion of the extended essay, Theory of Knowledge course (TOK) and CAS (creativity, action, service) activities. The maximum score of 45 includes three points for the combination of the extended essay and work in TOK. IB diploma holders gain admission to selective universities throughout the world, including University of Minnesota, Oxford, Yale, and Sorbonne. Formal agreements exist between the IBO and many ministries of education and private institutions. Some colleges and universities may offer advanced standing or course credit to students with strong IB examination results. The program is available in English, French, and Spanish. (Web site: http://www.ibo.org).
Limited English Proficiency (LEP)	A student with limited English Proficiency is defined as one whose primary language is not English and whose score on an English reading or language arts test is significantly below the average score for students of the same age. This definition is used by the Minnesota legislature; however, it may vary across school districts.
Local sources	The percent of revenues from local sources, including property taxes, fees, county apportionment, etc.
Master's degree	A degree awarded for successful completion of a program generally requiring 1 or 2 years of full-time college-level study beyond the bachelor's degree.
Mean score	What is normally meant by the word average. The total of the scores divided by the number of scores.
Metro Area	Refers to school districts located in Minneapolis, St. Paul, and the seven county metro area.
Mini-nation	The label given to individual states that participated in the TIMSS study. States were offered the opportunity to assess a state-representative sample of their students at the same time as the U.S. National TIMSS study. Colorado, Illinois and Minnesota joined in this program. Web site: http://www.ed.gov/NCES/timss/brochure.html
Minnesota Comprehensive Assessments (MCA)	These tests are given at the third and fifth grade levels to evaluate student progress on the Preparatory Standards and to measure the success of schools and districts in improving achievement over time.
Mobility	The number of times a student moves from school to school or district to district in a given year (frequent school or residence changes).

National Assessment of Educational Progress (NAEP)

NAEP is often called the "nation's report card." It is the only regularly conducted survey of what a nationally representative sample of students in grades 4, 8, and 12 know and can do in various subjects. The project is mandated by Congress and carried out by the National Center for Education Statistics at the U.S. Department of Education. Beginning in 1990, the survey was expanded to provide state-level results for individual states that choose to participate. The policy defines three NAEP achievement levels basic, proficient and advanced. The definitions for each level follow. A basic achievement level denotes partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade. A proficient achievement level represents solid academic performance for each grade accessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter. An advanced achievement level signifies superior performance.

The NAEP scores have been evaluated at certain performance levels. In reading a score of 300 implies an ability to find, understand, summarize and explain relatively complicated literary and informational material. A score of 250 implies an ability to search for specific information, interrelate ideas, and make generalizations about literature, science and social studies materials. A score of 200 implies an ability to understand, combine ideas, and make inferences based on short uncomplicated passages about specific or sequentially related information. A score of 150 implies an ability to follow brief written directions and carry out simple, discrete reading tasks. Scale ranges from 0 to 500. In 1994, the NAEP reading achievement levels were as follows: For Grade 4, basic achievement is a score of 208-237, proficient achievement is 238-267 and advanced achievement is above 268. For Grade 8, basic achievement is a score of 243-280, proficient achievement is 281-322 and advanced achievement is above 323. For Grade 12, basic achievement is a score of 265-301, proficient achievement is 302-345 and advanced achievement is above 346.

The NAEP scores have been evaluated at certain performance levels. In math performers at the 150 level know some basic addition and subtraction facts, and most can add two-digit numbers without regrouping. They recognize simple situations in which addition and subtraction applies. Performers at the 200 level have considerable understanding of two digit numbers and know some basic multiplication and division facts. Performers at the 250 level have an initial understanding of the four basic operations. They can also compare information from graphs and charts, and are developing an ability to analyze simple logical relations. Performers at the 300 level can compute decimals, simple fractions and percents. They can identify geometric figures, measure lengths and angles, and calculate areas of rectangles. They are developing the skills to operate with signed numbers, exponents, and square roots. Performers at the 350 level can apply a range of reasoning skills to solve multi-step problems. They can solve routine problems involving fractions and percents, recognize properties of basic geometric figures, and work with exponents and square roots. Scale ranges from 0 to 500. In 1996, the NAEP mathematics achievement levels were as follows: For

	Grade 4, basic achievement is a score of 214-248, proficient achievement is 249-281 and advanced achievement is above 282. For Grade 8, basic achievement is a score of 262-298, proficient achievement is 299-332 and advanced achievement is above 333. For Grade 12, basic achievement is a score of 288-335, proficient achievement is 336-366 and advanced achievement is above 367.
Open enrollment	Public-school-choice programs allow families to choose the public schools their children attend. Intradistrict programs limit a family's choice to some or all of the public schools in their own district. Open-enrollment programs allow families to choose schools outside the district in which they live.
Operations and Maintenance (Expenditure Category)	Expenditures for operation, maintenance, and repair of the district's buildings, grounds and equipment. Includes expenditures for custodians, fuel for buildings, electricity, telephones and repairs.
Other Operations (Expenditure Category)	Expenditures for general fund operating programs necessary to a district's operations but not able to be assigned to other programs. These can include federally funded community education services for students, property and liability premiums, principle and interest on non-capital obligations, and nonrecurring costs such as judgements and liens.
Outcomes	The desired results of an educational system
Outcomes-Based Education (OBE)	Is a structure at a school and district level that stresses clearly defined outcomes, criterion-referenced measures of success, and instructional strategies. These outcomes are directly related to student abilities and needs, flexible use of time and learning opportunities, recognition of student success, and modification of programs on the basis of student results. Web site: http://www.hrdc-drhc.gc.ca/hrdc/corp/stratpol/arbsite/research/r964sm_e.html)
Outstate	Refers to the school districts located outside the seven county metro area. For some purposes, they are divided into districts that have enrollments of 2000 students or less (2000-), or enrollments of greater than 2000 students (2000+).
Performance Standards	Performance standards define in what ways and how well students must demonstrate their knowledge and skills to be considered competent.
Per-pupil expenditure or per-pupil spending	The State's annual total spending on public K-12 education divided by its total number of students. An adjusted amount makes the number comparable by taking into account how much it costs school districts in different regions to recruit and employ teachers with similar qualifications.
Postsecondary enrollment options (PSEO)	This program allows high school juniors and seniors to enroll in classes at postsecondary institutions at public expense and receive both high school and college credit for their courses. The Minnesota program is two fold: To promote rigorous academic pursuits and to provide a variety of options to high school students.
Proficiency levels on the Minnesota Comprehensive Assessments (MCA)	There are four achievement levels that represent the expectations for academic success in Minnesota: • Level I: Students at this level demonstrate evidence of limited knowledge and skills necessary for satisfactory work in the High Standards in the elementary grades. • Level II: Students at this level demonstrate evidence of partial knowledge and skills necessary for satisfactory work in the High Standards in the elementary grades.

	• Level III: Students at this level demonstrate evidence of solid academic performance and competence in the knowledge and skills necessary for satisfactory work in the High Standards in the elementary grades. • Level IV: Students at this level demonstrate evidence of advanced academic performance, knowledge and skills that exceed the level necessary for satisfactory work in the High Standards in the elementary grades.
Profile of Learning	The second component of the Minnesota standards-based Graduation Rule. It is a taxonomy of preparatory standards (K-8th grade) and high standards (9-12th grade) that students are expected to achieve before leaving high school.
Pupil Support (Expenditure Category)	Expenditures for all non-instructional services provided to students, not including transportation and food. Includes expenditures for counseling, guidance, health services, psychological services, and attendance and social work services.
Pupil Transportation (Expenditure Category)	Expenditures for transportation of students, including salaries, contracted services, fuel for buses, and other expenditures.
Pupil/staff ratios	Pupil/staff ratios are based on the total number of pupils in attendance (ADA) at a school compared to the total number of licensed school personnel (FTE) (e.g. administrators, counselors, teachers, media specialists, speech clinicians, psychologists, etc.) in that school.
Pupil/teacher ratios	Are based on the total number of pupils in attendance (ADA) at a school compared to the total number of licensed teaching staff (FTE) in that school.
Regular Instruction (Expenditure Category)	Expenditures for elementary and secondary classroom instruction, not including vocational instruction and exception instruction. Includes salaries of teachers, classroom aides, coaches, and expenditures for classroom supplies and textbooks
Results-oriented educational system	Same as Outcomes Based Education.
Scale score	A scale score provides a common scale for different forms of a test used at a given grade or across age/gender levels.
Scholastic Assessment Test (SAT)	Formerly known as the Scholastic Aptitude Test, the SAT is commonly used as a college entrance exam.
School Accreditation Processes	The awarding of credentials to schools in particular the award of membership in one of the regional associations of educational institutions that attempt to maintain certain quality standards for membership.
School climate	The social system and culture of the school, including the organizational structure of the school and values and expectations within it.
School improvement programs	Programs with the intent to improve school quality.
SciMath[MN]	Founded in 1993. A state partnership of Minnesota business, education, and government pursuing statewide improvement in the teaching and learning of K-12 mathematics and science based on the national mathematics and science education standards. SciMath[MN]'s vision is to increase the educational achievement and participation of all Minnesota students in science and mathematics to help them meet the complex challenges of their future.
Site-based management	Governance arrangements designed to give the people closest to students the ability to make decisions about their education. Typically, teachers, parents,

	and administrators at the school site are given more say over such matters as staffing, budgets, curriculum, and instructional materials. But the level of autonomy granted to individual schools, who is involved in making the decisions, and whether they are focused on student learning vary widely.
Special education	Direct instructional activities or special learning experiences designed primarily for students identified as having exceptionalities in one or more aspects of the cognitive process or as being underachievers in relation to general level or model of their overall abilities. Such services usually are directed at students with physical, emotional, cognitive learning disabilities. Programs for the mentally gifted and talented are also included in some special education programs.
Stakes	Often described as the positive and/or negative consequences that are placed on students, schools or districts as the result of student achievement data. The terms "low stakes" and "high stakes" express the varying levels of risk being placed on those responsible for the expected results.
Standards	The knowledge or skill level necessary for a particular rating or grade on a given dimension of achievement. It is used as a basis of comparison. See content standards and performance standards.
State allocations	The percent of revenues from the Minnesota state government.
State funded learning readiness	The purpose of a Learning Readiness program is to provide all eligible children adequate opportunities to participate in child development programs that enable the children to enter school with the necessary skills and behavior as well as the family stability needed for them to progress and flourish. Learning Readiness is offered in 345 school districts in Minnesota. The cost per child for Learning Readiness varies depending on the level of participation. The average statewide cost is $382 per child.
Student poverty	In most of this report, student poverty refers to students eligible for free or reduced lunch. Other indicators are possible; e.g. students from families receiving aid for Families with Dependent Children.
Support Services (Expenditure Category)	Expenditures for central office administration and central office operations not included in district and school administration. Includes expenditures for business services, data processing, legal services, personnel office, printing, and the school census.
Teacher education	The amount of education a teacher has. The major distinction is between teachers having Bachelor's Degrees and those having Master's Degrees.
Teacher experience	Number of years in the teaching profession.
Teacher salaries	The annual pay received.
Third International Mathematics and Science Study (TIMSS)	TIMSS is a study of classrooms across the country and around the world. It is the largest international comparative study of educational achievement to date. The National Center for Educational Statistics (NCES) of the U.S. Department of Education, the National Science Foundation (NSF) and the Canadian Government funded the international TIMSS project to assess school achievement in mathematics and science in nearly 50 countries. TIMSS studied student outcomes, instructional practices, curricula, and cultural context. TIMSS provides a comparative international assessment of educational achievement in mathematics and science, and the factors that contribute to achievement. Web site: http://www.ed.gov/NCES/timss/brochure.html

Title I (Federally funded program)	Title I of the Elementary and Secondary Education Act (ESEA), as restructured by the Improving America's Schools Act (IASA) of 1994, has as its primary focus to help disadvantaged students acquire the same knowledge and skills in challenging academic standards expected of all children. By the beginning of the 2000-2001 school year, Title I requires that each State develop or adopt a set of high-quality yearly student assessments that measure performance in at least mathematics and reading/language arts. Such assessments are to be aligned with the State content standards and be used to monitor progress toward achievement goals for accountability purposes. In a key change from previous law, States now use the same assessment that is used for all children to measure whether students served by Title I are achieving the State standards. There is no longer any requirement for a separate assessment for Title I students. Web page: http://www.ed.gov/legislation/ESEA/Title I
Total Operating (Expenditure Category)	The total of the following categories: administration, support services, regular instruction, vocational instruction, exceptional instruction, instructional support, pupil support, operations and maintenance, food support, pupil transportation and other operations. This figure includes all expenditures incurred for the benefit of elementary and secondary education during the school year, except for capital and debt service expenditures.
Vocational Instruction (Expenditure Category)	Expenditures in secondary schools for instruction that is related to job skills and career exploration. Includes expenditures for home economics, as well as industrial, business, agriculture, and distributive education.
Vouchers	Vouchers enable families to use public tax dollars to pay for their children's education at a public or private school of their choice. Voucher programs may or may not include private religious schools.

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