

AIMING HIGHER:

**A REPORT ON
EDUCATION STANDARDS AND POLICY FOR**

MINNESOTA

Prepared by Achieve, Inc. and the Council for Basic Education for

Commissioner Christine Jax
Minnesota Department of Children, Families and Learning

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TABLE OF CONTENTS

| | |
|---|----|
| Executive Summary..... | 3 |
| Introduction..... | 8 |
| Raising Standards: Achieve and CBE | |
| Raising Standards: The National Context | |
| Raising Standards: Minnesota’s Efforts | |
| Methodology..... | 14 |
| Part One: The Standards Review | |
| Part Two: The Policy Review | |
| Results of the Standards Review..... | 18 |
| The Profile of Learning: Strengths | |
| The Profile of Learning: Areas for Improvement | |
| Recommendations for Moving Forward | |
| Results of the Policy Review..... | 31 |
| Assessing Student Achievement of the Profile of Learning | |
| Accountability for Adults: A System to Support High Standards | |
| Strengthening Public Support for High Standards | |
| Recommendations for Moving Forward | |
| Conclusion: Sustaining Standards-Based Reform..... | 46 |
| Appendix A: Excerpts From Exemplary Standards | |
| Appendix B: Summary Reviews | |
| Appendix C: Materials Consulted | |
| Appendix D: List of Standards Experts and Individuals Participating in Interviews | |

EXECUTIVE SUMMARY

In the past decade, the movement to raise academic standards and achievement for all students has become the most important and enduring strategy to improve education in the U.S. To improve the education system for all its students, Minnesota embarked down the path of standards-based reform in the 1970s and continued to hone its efforts through the 1980s and up to the year 2000. These efforts have included committing to performance-based education, developing a graduation rule and writing the Profile of Learning in 10 (now 11) learning areas.

Beginning in early 1999, legislators and other stakeholders in Minnesota approached Achieve, Inc., with requests for assistance with education reform in Minnesota. The Department of Children, Families and Learning (CFL) contracted with Achieve and the Council for Basic Education (CBE); and our joint review was underway by February 2000. Our goal has been to assist the state in continuously improving its expectations for students by providing a credible, independent analysis of the quality and rigor of the academic expectations embodied in the Profile of Learning; and to couple that analysis with a review of the policy context in which those standards exist. We sought to answer the following questions:

- What is the quality of the Profile of Learning? How clear, specific, measurable and challenging are the expectations it places on students?
- Do the laws, rules, curriculum guides, and interpretation and support documents provide a comprehensive system that supports districts in ensuring common high standards for all?

By seeking out Achieve and CBE's review of the state standards and accountability policies, Minnesota has demonstrated its commitment to establishing a world-class education system by considering mid-course corrections that might be necessary to keep pace with other states and nations. After nearly a decade of developing and implementing standards, the state has the opportunity to reflect on what has worked well and what can be strengthened. Our report should prove helpful in this regard, as we point to a number of strengths in the Minnesota system and a number of areas that deserve special attention if the standards, assessments and accountability policies are to continue driving instruction and achievement in the right direction.

RESULTS FOR MINNESOTA

Our careful analysis of the Profile of Learning and supporting assessment and accountability policies reveals both strengths and weaknesses:

Strengths of Minnesota's System

- **Policymakers and officials deserve praise for taking a strong stance on standards-based reform and remaining committed to using standards as a critical lever to improve teaching and learning.** Although people differ on the specifics of the policies, we found broad agreement among Minnesota policymakers, parents, educators, school district

leadership, and business and community leaders that statewide standards and assessments are critical components of a strategy to raise achievement for all Minnesota's children.

- ❑ **The emphasis on applying knowledge to real world problems and measuring achievement through performance tasks is commendable.** Other states are also emphasizing these skills in an effort to prepare students for the challenges they face in the 21st century, but in our judgment no state has allowed these ideas to drive their education standards and reforms as significantly as Minnesota.
- ❑ **Minnesota's assessment system includes multiple ways for students to demonstrate what they know and can do; this admirable feature should be preserved and built upon.** Minnesota's assessment system combines "multiple measures" to assess student achievement. By combining locally developed performance projects and exercises, standards-based performance assessments in grades 3 and 5, and the "safety net" 8th grade statewide test, Minnesota has avoided many of the issues raised by critics of accountability in states that implemented a single high-stakes, standards-based graduation test.

Areas for Improvement

- ❑ **The emphasis on applied learning in the Profile of Learning comes with a price: Content knowledge in each of the academic disciplines is minimized.** In the Profile, the standards tend to focus more on "how" students show what they have learned than "what" they have learned. In our view, challenging and relevant academic standards define both the concepts students should learn and the skills they need to apply those concepts without choosing artificially between knowledge and application. Providing sufficient detail about the content knowledge all students need to gain is extremely important, and will not necessarily infringe on local control of curriculum.
- ❑ **The standards need more clarity, specificity and focus if they are to be applied rigorously across the state.** We are concerned that the standards are not clear or specific enough to help all school districts improve teaching and learning. More specificity about what students should know and do will not only make the standards more meaningful and useful to teachers and parents, but will also help ensure that they are interpreted and applied consistently across the state. We are concerned that, as they are currently written, some teachers could translate the standards into very rigorous classroom expectations; but others might interpret them to mean something far less challenging.
- ❑ **The comprehensiveness of the Profile — containing 10 and soon 11 learning areas — undermines the standards' focus and manageability.** While noble in its goal of broadening the learning experiences of all children, we are concerned that the Profile sacrifices depth of knowledge for breadth of topics, and may de-emphasize the core subject areas — especially English language arts, mathematics, science, and the social sciences — that other states and nations consider most essential.
- ❑ **We are concerned that the system now in place for holding students accountable for meeting the Profile of Learning standards is too decentralized to guarantee**

comparability and equity across the state. In contrast to the Minnesota Comprehensive Assessments and Basic Skills Tests — which rely on common tests developed and administered by the state to all students — the Profile of Learning is assessed on a school-by-school basis with different projects, activities, tasks and exercises. Since development of the Profile projects and assessments is locally driven, the quality and comparability of these assessments is very difficult to guarantee. While this structure is in line with the strong tradition of local control in the state and helps to bring classroom instruction and assessment closer together, in our judgment, it does not ensure that all students are taught to common high standards. Local performance projects are important and valuable, but should not be the primary tool used for measuring student achievement of the standards.

- ❑ **The recent legislative decision to make the Profile of Learning a local option may have temporarily eased the burden on local districts and schools, but it does not advance the state’s goal of high standards for all students.** In our view, the flexibility school districts now have in deciding which standards will be assessed and which will be needed for high school graduation may lead Minnesota to a system of high standards for some students and low standards for the rest. If the standards are too broad or the implementation requirements too burdensome, we encourage the state to address those issues head on and revise and strengthen the Profile.
- ❑ **In our view, at this time, the burden for reaching higher standards is primarily on students; schools need more capacity, assistance and accountability for improvement.** Firm but fair education accountability systems hold adults as well as students accountable for higher performance. Minnesota does not yet have many of the crucial elements in place — including assistance to low-performing schools and incentives and consequences for performance — to ensure that educators and school officials are providing all students with opportunities to meet the standards.

RECOMMENDATIONS FOR MOVING FORWARD

Achieve and CBE recommend that Minnesota education policymakers consider taking several steps to ensure that all students are given time and opportunities to achieve common high standards. While there are several avenues Minnesota could take to address this report’s conclusions, we believe that the state is at a critical juncture and the time is right to address the issues we raise head on — by revising and strengthening the Profile of Learning standards, assessments and accountability policies.

- ✓ **In the spirit of continuous improvement, we recommend revising the Profile of Learning standards to provide greater clarity, specificity, depth and rigor.** We believe there are a number of improvements that could be made to the Profile, including specifying the content knowledge all students will need in order to apply their learning; integrating cross-cutting skills into each content area; eliminating redundancies across learning areas; and providing greater focus and depth in the key topic areas. As many other local control states have demonstrated, providing greater detail and integrating content with skills need not mean that the state is infringing on districts’ responsibilities to develop and implement

curriculum, which is the most appropriate and reasonable expression of local control. Rigorous, content-based academic standards and local control of curriculum can go hand-in-hand.

- ✓ **To ensure that all students master a common core of learning, we recommend that the state consider developing statewide performance assessments to measure student achievement in the core subject areas and making these assessments a key factor in graduation requirements.** If the state expects all students to achieve high standards, it must take greater responsibility for measuring student achievement in high school. The groundwork for this has been laid by the Minnesota Comprehensive Assessments. To ensure that the testing system is not overly burdensome, we recommend starting with the core academic areas of English language arts, mathematics, science and the social sciences. Local schools can continue to improve teaching and learning through locally-developed and -administered performance activities and exercises, but we do not recommend relying on those local measures as the primary indicator for determining whether a student has met the statewide high school graduation requirements. It is possible that these local assessments could be combined with achievement results from the statewide assessments to determine graduation.

- ✓ **We encourage the state to explore various options and take steps toward a more comprehensive system that not only holds students accountable for their performance but also schools and districts as well.** Minnesota should investigate and develop systems to identify, assist and intervene in persistently low-performing schools so that no student is trapped in a failing school. This includes training and technology systems to ensure that educators at every level in the education system have the resources and support they need to provide every student with rigorous, meaningful educational experiences.

- ✓ **Minnesota should continue to build and sustain public support for education reform. We urge state policymakers to work with educators, parents, and business and community leaders to make the necessary changes to the Profile while staying the course on standards-based reform.** As Minnesota moves forward to improve its expectations for all students, we encourage state leaders to communicate to all Minnesota citizens, and especially educators, that continuous improvement does not mean a total change in direction or a change in the course of reform. Minnesotans need to understand that the state is committed to standards-based reform for the long-term, and that the expectations for students and schools must grow and evolve over time, so that Minnesota's students are prepared for the challenges of a rapidly changing world. Maintaining strong support for standards among government leaders and the public, and partnering with education, business and civic leaders to communicate this broad support, will be essential in raising achievement across the state.

* * *

Education reform is at a crossroads in Minnesota. By taking the steps we outline in this report to

improve the Profile of Learning and the policies that support it, we believe that policymakers can address the concerns being raised by educators, parents and the business community, while continuing their commitment to high standards for all. We at Achieve and CBE are grateful for the opportunity to conduct this analysis and hope that the information provided in this report will be helpful to Minnesota as the state continues to work toward a higher-performing and more accountable education system.

INTRODUCTION

RAISING STANDARDS IN AMERICA'S SCHOOLS: ACHIEVE AND CBE

Since the release of *A Nation at Risk* in 1983, schools, states and national policymakers have become concerned with improving the level of academic achievement of all students. At that time, most school systems awarded diplomas based on Carnegie units, which generally represented “seat time,” as opposed to a demonstration of knowledge and skills. Under the Carnegie or credit-based system, postsecondary institutions and employers had difficulty determining what students had learned, since course content varied from school to school. It was also increasingly clear that a large percentage of our nation’s students, particularly minority and poor students, were being dramatically under served by their education system, as they were not provided with the same rich curriculum and learning opportunities as their wealthier counterparts in the suburbs.

In an attempt to raise the level of student learning across the board and create a more publicly accountable education system, states, districts and national content organizations began the process of drafting content standards to define what students should know and be able to do. Since the early 1990s, 49 states have developed academic standards and are putting in place assessments to measure those standards. By stating clearly the knowledge and skills students are expected to gain as a result of their schooling, reformers hoped that students would better understand what is expected of them; schools would improve their programs to help students achieve those expectations; and low-performing districts and schools in particular would be challenged to raise the level of teaching and learning. In Minnesota and across the country, standards are now the driving force in efforts to improve equity and excellence in education by holding *all* students to common high expectations.

Achieve was created by governors and business leaders after the 1996 National Education Summit to help states ensure that they have in place standards that compare favorably with the academic expectations of other states and high-performing nations; assessments that accurately measure student achievement against those standards; and accountability systems that provide fair and meaningful incentives to meet the standards. At the 1999 National Education Summit sponsored by Achieve, the nation’s governors, leading corporate executives and educators endorsed plans to advance these efforts further, identifying strengthening standards, assessment and accountability systems as key priorities along with improving educator quality and helping all children achieve higher standards. An independent, bipartisan, nonprofit organization overseen by a Board of Directors composed of governors and corporate CEOs, Achieve serves as a clearinghouse and resource center on education standards, testing and accountability, and has worked with over 20 states to date to support their work in these areas.

In 1956, CBE was founded by a group of concerned citizens who were convinced that there is an intimate relationship between a healthy democracy and excellence in public education and were dismayed at the academic deficiencies in the nation’s elementary and secondary schools. CBE is a national, nonprofit organization that directs its programs and publications to strengthen

teaching and learning of the basic subjects — English, history, government, geography, mathematics, the sciences, foreign languages and the arts — to prepare students for lifelong learning and responsible citizenship. A staunch advocate for excellence in education, CBE has earned a reputation as an impartial critic of education reform and as a leading proponent of rigorous academic standards for all students. In that role, CBE has worked with 17 states and as many school districts in developing, reviewing, revising and implementing academic standards, as well as supporting programs in professional development, improving teacher education and comprehensive school reform.

Both CBE and Achieve believe strongly in the value of external reviews of state standards and programs. Collectively, we have provided in-depth evaluations of standards, tests, curriculum and accountability to policymakers in over 20 states and a dozen urban, suburban and rural school districts. Like Minnesota, these states and districts are committed to raising standards for student performance and want to ensure their citizens that the standards they have set for their students compare favorably with the expectations of other states and nations. They also want information on how well the policies that surround their standards support their goals in raising achievement. And they want objective, credible, concrete recommendations for ways to improve their standards and policies.

RAISING STANDARDS: THE NATIONAL CONTEXT

CBE and Achieve believe that over the last several years states have come a long way in their efforts to improve the quality of education for all students through the development and implementation of standards. While in earlier years developing clear, rigorous, measurable standards was a challenge for many states, the education community now has a clearer picture of what strong academic standards look like: They are clear and specific enough to inform curriculum planning and test development without infringing on local control. They set rigorous yet reasonable expectations for all students and raise the bar higher than it is currently set for many students. They integrate content knowledge with important skills and processes. And they are widely read and understood by parents, educators, businesspeople, and policymakers. These basic criteria about what constitutes strong, useful state standards are now widely agreed to among educators at the national level. The appendix to this report includes examples from state standards that are among the exemplary standards Achieve and CBE hold up for states and districts as strong models of standards that meet these criteria.

Most states have moved from the often difficult stage of developing standards to the beginning stages of implementation — during which many have begun to incorporate feedback from educators and the public and revise their standards and policies as necessary. Now many states are grappling with other important issues: How should a state assess student performance and hold students and schools accountable for meeting standards? What structures best support implementation of standards? What is the appropriate balance between state leadership and local control? Through lessons from the 49 states engaging in standards-based reform, we are learning a lot about these questions as well.

In particular, states are now beginning to refine the relationship between the state and local districts and schools. Of course each state has a different balance, but states and districts are

learning that respecting local control while ensuring high standards for all students means being clear and specific about the knowledge and skills students are expected to learn, while leaving the “how” of education up to schools and districts.

This innovation is at the heart of standards-based reform. The previous state role of monitoring compliance to rules and regulations has shifted to one of setting expectations for results and supporting schools and districts in meeting those expectations. In a standards-based system, schools now can focus on how to organize themselves to achieve results, including integrating standards into local curriculum; improving instructional strategies and programs; making decisions about textbooks and other resources; providing extra help to students in danger of not meeting the standards; interpreting and using data from state and local assessments; and organizing the school day and year to meet the needs of all students.

Setting standards has not always been easy. During the difficult work of deciding what all children must know and be able to do to succeed in the 21st century, many states have undergone debates that get to the core of our philosophies about education. Some states have incorporated progressive thinking into their standards and have focused on critical thinking skills and applied learning — sometimes at the expense of content — while in other states, the “back-to-basics” approach has tended to focus more on what students should know in the core academic areas than on what they should do with that knowledge. Ultimately, there is credible research and data to support all sides, and the lesson states are learning is that a balanced approach — one that does not follow the pendulum swing too far in either direction — will improve teaching and learning most substantially for all students.

RAISING STANDARDS: MINNESOTA’S EFFORTS

Minnesota is often cited as a state with a high-quality education system; its scores on national tests like the ACT, SAT, National Assessment of Educational Progress (NAEP), and Third International Mathematics and Science Study (TIMSS) are among the highest in the U.S. Some may question why the state even needs this kind of reform. But Minnesota, like every state in the Union, has its own challenges.

For one, Minnesota’s poorer students and students of color, particularly those in urban areas, still struggle. In Minneapolis, 45% of African-American students and 40% of Native American students in the class of 2000 still had not passed at least one of the Basic Skills Tests required for graduation as of February 2000 — four years and multiple opportunities to learn the material later.¹ Students begin taking these tests in the 8th grade. When the tests were first administered in 1996, nearly 80% of black and 70% of American Indian 8th graders in Minneapolis failed both tests, compared to a 30% failure rate among white students.² Furthermore, while the dropout rate for the state is 11%, the dropout rate in Minneapolis is 37%, and the St. Paul dropout rate is 24%. Statewide, dropout rates were 39% for blacks, 33% for Hispanics and 17% for Asian Americans,

¹ *Minneapolis Star-Tribune*, “Community Urged to Help Black Kids Succeed,” February 9, 2000.

² Hubert Humphrey Institute of Public Affairs, *Analysis of the 1996 Minnesota Basic Standards Test Data*, University of Minnesota, 1997.

compared to just 8% for whites for the 1997–1998 school year.³

And as in many other states, rural districts are also struggling to lower dropout rates and improve student achievement. For example, two districts, both with high Native American populations, have dropout rates higher than or on par with those in Minneapolis and St. Paul. Red Lake, located within a reservation and almost 100% Native American, has a dropout rate of 36%. Similarly, Cass Lake, also located within a reservation, has a dropout rate of 24%.⁴

Thus, the call to reform in Minnesota has been strong. In the 1980s, Minnesota business leaders, parents and other citizens demanded stronger assurance that graduates had gained the knowledge and skills necessary for success in postsecondary education and employment. From the start, educators and policymakers in Minnesota set about standards-based reform differently from many other states. According to official documents provided by the state, Minnesota favored a performance-based system: one that considered the arguments in favor of a constructivist⁵ vision of education and emphasized interdisciplinary and applied learning. The system of standards and “results-based” rather than “input-based” graduation requirements that the state went on to develop reflects these commitments and goals.

During the development of the Basic Requirements and the Profile of Learning, Minnesota set some specific goals for the state’s education system:

- that students be prepared for postsecondary education, the world of work and be competitive in a global economy;
- that all learners are provided opportunities that recognize their uniqueness and maximize their achievement;
- that parents and local communities maintain the right to design curriculum, instruction and school opportunities they believe will best serve their students;
- that learning experiences be comprehensive;

- that student achievement be recorded and reported meaningfully; and
- overall, that there be stronger accountability for high learning standards, higher achievement and better preparation of Minnesota students.⁶

³ Minnesota Department of Children, Families and Learning, *Completion Study for the Class of 1998*, 2000.

⁴ Minnesota Department of Children, Families and Learning Web site, <http://www.educ.state.mn.us/>.

⁵ According to state documents, “Minnesota’s approach to standards and assessment enhances opportunities for teachers to use constructivist principles of teaching and learning ...” and “Constructivism is defined as the premise that students use their prior knowledge to construct a personally meaningful understanding of new information or experiences that are the focus of their learning. The implications for instruction are that teachers should actively engage students in designing their own unique understanding of content, and that teachers should legitimize and celebrate the design differences from student to student.” *Links Between Research and Reform*, April 2000, Minnesota Department of Children, Families and Learning, p.8.

⁶ Minnesota State Board of Education, Statement of Need and Reasonableness in the Matter of the Proposed Permanent Rules Relating to Graduation Rule, Profile of Learning: Chapter 3501 (3501.0300 to 3501.0469), pp. 15–19

One component of the system was designed as a “safety net”: the Basic Requirement and the Basic Skills Tests (BSTs). These tests in reading, writing and mathematics were established at a basic level, designed to reflect what a high school graduate might need in a real world entry-level job. The tests were to be administered in or around the 8th grade, would be required for graduation and could be taken multiple times if needed. The idea here was to catch any students who might graduate without the most basic of skills and provide them with extra help and learning opportunities. The classes of 2000 and 2001 would be the first required to meet the Basic Requirements.

The other half of the system came to be known as the High Standards, also known as the Profile of Learning. These were standards meant to challenge students and allow them many different ways to demonstrate their knowledge. They emphasized applied knowledge, interdisciplinary learning opportunities and development of 21st century skills such as those outlined by the Secretary’s Commission on Achieving Necessary Skills (SCANS) in 1991— communicating effectively, working in groups and problem solving.

From the beginning, Minnesota’s Profile of Learning departed from the path that most states took in developing standards and aligned assessments. In part due to Minnesota’s commitment to local control, much of the content students might need to know was left out of the state standards, while the skills with which they would demonstrate that knowledge became the focus of the Profile. In 1998, the 103 “content standards” contained in the Profile were approved, and the state determined that students in the class of 2002 would be required to demonstrate mastery of 24 out of 48 high school content standards for graduation. A recent legislative decision overturned that requirement; the number of standards students must meet now is determined locally by a majority vote between elected school boards and teachers.

When the standards were developed, the state devised a system of assessment that meant that achievement of the Profile of Learning would be performance-based and locally controlled — again, a departure from the common route to aligned assessments. During the earlier years of implementation, the state assisted in the development of model “performance packages” or performance tasks that could be used to measure student achievement of the standards. Districts also could develop their own packages as long as they could document that the local packages were equivalent to the state models. The state developed scoring criteria, or rubrics, by which to measure student performance; again, rubrics also could be developed locally. Finally, the state began to put resources and energy into building capacity by implementing comprehensive

training programs, developing extensive training materials and ensuring that every district had a trained expert on the standards.

Implementation of these initiatives has been difficult. According to interviews we conducted with local officials and teacher leaders, some schools and districts find the standards to be burdensome and overly complex as teachers struggle to alter their curriculum and districts struggle to develop course offerings and schedules that allow students sufficient opportunities to meet the Profile requirements. The extent to which schools have integrated the Profile into their

curriculum varies greatly across the state. There has been confusion about the specifics of certain policies, such as those pertaining to assessment, grading and record keeping. Many observers are concerned that there is not enough capacity in the 300-plus school districts to sustain these reforms. And recently, the legislature enacted mid-course corrections to the standards and Graduation Rule. Mid-course corrections are a natural part of setting standards, and, as in other states, observers in Minnesota expect more improvements to come.

METHODOLOGY: REVIEWS OF STANDARDS AND POLICIES

Achieve has partnered with CBE to conduct a thorough review of the Profile of Learning and the implementation, assessment and accountability policies that surround and support it. This review has included a comprehensive evaluation of the academic expectations in the Profile of Learning. That evaluation was coordinated by CBE and included expert reviewers from across the country as well as from CBE staff. Achieve led the review of policies and initiatives surrounding the Profile, and focused on CFL documents pertaining to such policies; careful perusal of the legislation relating to the Profile and its implementation; conversations with a variety of stakeholders; and examination of materials supporting the Profile, such as training manuals and videos. The goal of this report is to provide feedback on the quality of the Profile of Learning standards and offer suggestions for how Minnesota can strengthen its system of standards and assessments to provide a strong foundation for all of its school reform efforts.

PART ONE: THE STANDARDS REVIEW

CBE reviewed the Profile of Learning based on the criteria they and Achieve have used to evaluate the standards of over 20 states. These criteria represent a broad consensus among education organizations about the qualities that distinguish exemplary state standards from marginal ones, and are an objective tool designed to evaluate any set of standards. To ensure that the criteria met Minnesota's needs for the standards review, the Minnesota Department of Children, Families and Learning worked with CBE and Achieve to elaborate on the criteria, particularly the supporting questions:

- **Important Academic Subject Matter:** How well do the standards reflect the intrinsic importance and practical significance of academic subject matter? Do the standards require use and application of knowledge generally agreed to be the core knowledge in a subject area?
- **Rigor:** Do the standards set a high level of rigor for all students? Do they include the essential concepts and skills at the level of sophistication required of the best standards in the nation and the world? Do the standards require higher level thinking skills? Do the standards require use and knowledge, concepts, and processes:
 - 1) generally agreed to be at or above “grade level” and
 - 2) necessary to be ready to succeed in postsecondary education and employment?
- **Balance of Knowledge and Skills:** How well do the standards balance the mastery of important facts, ideas and key concepts with the intellectual and practical skills needed to understand and practice the activities of every subject? Do some standards require significantly more work from students than others? Is there a strong but appropriate inclusion of applied learning in the standards?
- **Progression and Grade-by-Grade Development:** Is there a clear progression of knowledge and skills from grade level to grade level? To what extent are the standards developmentally appropriate? Are some standards (or parts of standards) beyond a high school level? Are

there redundancies across standards? Could some be consolidated?

- **Specificity:** Are the standards appropriately specific? Are they broad enough to allow teachers to develop their own curricula yet detailed enough to provide clear expectations about what the student will know and be able to do?
- **Measurability and Potential for Instruction:** Are the standards measurable — that is, do they specify results that can be measured and communicated to students, teachers, parents and the public? How well do the standards support a coordinated system that may also include curricula, performance standards, assessments and teaching standards?
- **Clarity:** Are the standards written in clear language? Is the standards document organized so that it is understandable and useful for parents, teachers and the general public? Can educators translate the standards into classroom practice? Are the expectations clear — do the standards state clearly what students must know and be able to do?
- **Focus and Manageability:** Are the standards focused — do they avoid the conundrum of being a “mile wide and an inch deep”? Do the standards show evidence of clear choices about what is important for students to know and be able to do? Are the standards manageable, or are they of such a length and organization that would inhibit implementation?
- **Public Support:** Can the standards be supported by educators, parents and the general public? Are there red flags that would cause concern among the public? Do the standards convey a sense of consensus by educators, parents, and community member about what is important for students to know and be able to do?

These criteria (as well as additional subject-specific issues that are identified in the Summary Reviews) served as the basis for the evaluation of each learning area within the Profile of Learning. CBE and Achieve worked with CFL to develop a pool of potential expert reviewers representing a variety of philosophies and including current K–12 teachers; faculty members from higher education institutions with deep content knowledge; staff from other state departments of education with a background in standards work; and nationally known standards consultants. In collaboration with CFL, CBE and Achieve selected nearly 20 experts to provide in-depth analyses of the Profile and suggestions for strengthening its quality and usefulness. In addition, a half-dozen CBE staff reviewed the Profile of Learning and supporting curriculum frameworks. Summaries of these expert reviews, written and compiled by CBE, are included in Appendix B. Appendix D lists the experts who evaluated the Profile of Learning.

PART TWO: THE POLICY REVIEW

To complement the standards review, Achieve and CBE analyzed the policies surrounding and supporting the Profile of Learning. Similar to policy reviews Achieve has conducted for other states, the review for Minnesota included an evaluation of an extensive set of materials provided by CFL, including documents from the legislature, state board, independent taskforces and the state university; internal CFL documents; training materials; curriculum frameworks developed by CFL and others to support the Profile; scoring criteria; and the Department’s Web site. The CBE and Achieve review team also analyzed external studies of education reform in Minnesota

and several months' worth of news articles. Additionally, Achieve and CBE conducted a series of interviews with over 30 stakeholders, including state legislators, representatives of the governor, district leadership, principals, teachers, parents, business and community leaders, and other observers. Appendix C lists the materials consulted for this review, and Appendix D notes those individuals with whom we talked.

Stakeholders interviewed considered the following questions:

- Recently-enacted legislation addresses policy and program issues regarding the Profile of Learning. In what ways do this legislation and other current state policies contribute to a delivery system for implementing the Profile of Learning standards?
- How well does the Profile of Learning establish a statewide common core of expectations? Is the breadth and depth of the 10 learning areas contained in the Profile law appropriate for all students?
- How do you view the current policy of local school sites in conjunction with local school boards selecting which standards are required for high school graduation?
- Of the 24 standards required by the state for high school graduation (if local schools and boards do not concur on which standards are required), in your view, which are most essential for all students to master and which are less essential? Why do you consider these standards to be the most or least essential? What changes, if any, would you suggest to strengthen the distribution of these requirements?
- To your knowledge, are the technology and resources available in local school buildings adequate to support maintaining accurate and useful records of student achievement of the standards? What needs to be available to support schools in maintaining accurate and useful student records?
- What changes, if any, would you suggest to strengthen the content and implementation of the Profile of Learning graduation standards?
- In the absence of statewide model performance packages, how will local schools and districts measure achievement of the standards? How similar or dissimilar will local assessments be across the state?
- Recently, many researchers and policymakers nationally have talked about the importance of “multiple measures” to build a strong picture of student achievement of state standards. Minnesota’s system, which includes local curriculum-embedded measures and the Minnesota Comprehensive Assessments (MCAs) aligned to the Profile, as well as the BSTs, could be characterized as having multiple measures. How well do these pieces fit together to form a coherent system that yields important and complementary information about performance?
- What changes, if any, would you suggest to strengthen the system for assessing the Profile of

Learning?

- Are accountability policies to support implementation of the Profile of Learning distributed fairly among key stakeholders (i.e., students, individual teachers, principals, whole schools, and school districts)? Are other accountability mechanisms in place that might *not* support local implementation of the Profile of Learning?
- Are the incentives and sanctions for adults that are in current policy strong enough to promote higher student achievement?
- What accountability policies, if any, which are *not* currently in place would strengthen system performance?

The information from these documents and interviews was carefully considered in the context of Minnesota's education reform history and in light of our expert review of the Profile of Learning. Achieve and CBE crafted findings that address the quality of the Profile of Learning and its implementation across the state under past and current policies. This report highlights our main conclusions and offers recommended steps for moving ahead with the hard work of raising performance for all Minnesota students and schools.

RESULTS OF THE STANDARDS REVIEW

Our analysis of the quality of the Profile of Learning focused on the set of criteria for strong standards developed by CBE, which was elaborated on by Achieve and CFL. Because we know Minnesota policymakers need concrete suggestions for improving the standards, our review focuses mainly on the gaps and areas for improvement in the standards.

The standards of the Profile of Learning have some notable strengths, particularly their commitment to performance-based learning. However, overall, the standards are not clear and specific enough about the knowledge and skills all students should learn, which impacts their rigor, sophistication, focus and manageability.

THE PROFILE OF LEARNING: STRENGTHS

Our review uncovered a number of strengths in the Profile of Learning that can be built upon throughout the standards.

1. Minnesota’s standards encourage students and schools to take a hands-on view of education.

Students are asked to apply their knowledge in real world situations through practical and authentic tasks. This emphasis on performance-based learning can result in the development of critical thinking skills and an in-depth knowledge of the material studied. Students have greater opportunities to develop important 21st century skills, including problem solving, effective communication, working with groups and using technology. Research has shown that students who engage in performance activities that encourage them to apply knowledge will better retain what they have learned and develop more interest in schooling.

2. The mathematics and science standards reflect the key domains found in high-quality state and national standards.

The topics in the standards for science and math generally contain the same topics and categories as do the national standards and good state standards. They also require all students to develop reasoning skills through meaningful problem solving, research and experimentation. In particular in mathematics, some of the basics of mathematics are covered well for intermediate level students. Students must show mastery of number operations, place value and other topics, and they must do so by solving problems. The content is not always as specific as it should be, but the broad concepts are present.

3. A beginning of a foundation for early literacy is laid in the Minnesota primary level standards pertaining to English language arts, and the standards specifically mention that all students are expected to learn proper grammar.

Since reading at grade level by 3rd grade is essential for success in school, strong state standards are especially important for grades pre-K–3 in reading, writing, listening, and speaking. A beginning foundation is present in these standards. In the Minnesota Profile, students must show evidence of reading skills, comprehension skills and the ability to interpret new words. Moreover, the standards require all students to master standard written and spoken English. Use of conventions is also specifically mentioned in these learning areas — something other states have left out of their standards.

4. Other subject areas contain important strengths. In particular, by including a set of standards for “inquiry and research,” the state has signaled the importance of having students engage in fundamental research processes.

This emphasis is found in mathematics, science, history, civics and other topics, such as business and marketing. The ability to conduct original and secondary research and evaluate the credibility and usefulness of data and information is critical in the 21st century. In meeting the requirements of some of the standards in the Learning Area of Inquiry and Research, students have for example, the opportunity to investigate how historical knowledge is the result of decisions made by recorders of history, analyze current issues; engage in the research process, and utilize the skills of market research.

Much of the important subject matter in the areas of business, as well as health and physical education is covered by the Profile. Many of the skills some students may need in the world of business, such as developing a business plan and financial management, are well covered in the Profile, and are framed as practical and applicable tasks. And, the standards for health and physical education demonstrate more practical applications of health and fitness knowledge than is typically seen in state standards, making them more useful and more helpful to teachers and schools.

THE PROFILE OF LEARNING: AREAS FOR IMPROVEMENT

Despite these strengths, our analysis of the Profile of Learning indicates that more work is needed to ensure that the state’s standards are clear, specific, rigorous and manageable. While innovative and promising, the Profile has significant weaknesses that compromise many of its innovative goals:

- The standards lack clarity and specificity;
- Important topics are missing or underemphasized;
- There is inadequate rigor and growth across grade levels; and
- The focus and manageability of the standards is weakened by the broad nature of the standards and the large number of learning areas.

Most of these problems exist throughout the Profile. In this section of the report, we will discuss each of these issues and give examples from a variety of learning areas. CBE’s summaries of expert reviewers’ comments on each learning area are included in Appendix B.

1. Clarity and Specificity

These two criteria emerged as the most critical in the review of the Profile of Learning. In every learning area, our experts found that the Profile of Learning is neither clear nor specific enough to consistently and sufficiently communicate what students should know and be able to do. This lack of clarity and specificity impacts every aspect of the Profile, including its rigor, manageability and usefulness as a document to be used in teaching.

There is a growing consensus among states and national organizations that clarity and specificity are key characteristics of high-quality standards, because without them, standards do not effectively communicate to critical audiences. Without clear, measurable and jargon-free standards, parents and the public will not understand what all students are expected to know and be able to do. Without sufficient specificity, educators will not be able to design standards-based instructional programs, select curriculum materials, or choose among technology options to advance learning and enable all students to meet high standards.

There is also a serious equity issue at stake here. If the standards are too broad, they will not guarantee that all students — regardless of where they live — are provided with world-class learning opportunities. To close the achievement gap among advantaged and disadvantaged students and simultaneously lift up all students to new levels, Minnesota’s standards must provide teachers and school officials, parents, community leaders, businesspeople, and others who support students and schools with more information about what is most important for all Minnesotans to know and be able to do.

It is clear that Minnesota made a choice regarding the level of detail to provide about the content students should learn. However, there are costs associated with this choice, and CBE and Achieve are concerned that the Minnesota standards have created broad standards at the expense of adequate clarity, specificity and depth. The balance to be struck between providing sufficient guidance about the knowledge and skills all students need and preserving local control of curriculum decisions is a delicate issue. In many other states, regardless of educational philosophy, as high stakes for performance begin to be phased in, educators and the public have asked for more detail and better tools to align teaching and learning with standards and assessment.

- **Many of the standards in the Profile are written too broadly, without adequate specificity about the content and skills students should know and be able to do.**

The lack of clarity and specificity can be found in almost all subject areas. In the high school Write and Speak standards, for example, students are to write “for a variety of academic purposes and situations” or “for a particular audience,” but little more is said about the kinds of writing students are expected to produce. Should students know how to write a complex

persuasive essay? What about a personal essay? A technical manual? What type of literary critique should students be able to write? What are the characteristics of a high-quality piece of writing?

Another example can be found in the middle level in Scientific Concepts and Applications. Students are to “demonstrate understanding of the fundamental laws and concepts of the physical world including properties of matter, physical and chemical changes, transfer of energy, and force and motion ...” But it is not clear which concepts are considered fundamental. Does this statement include heat energy or chemical energy? What about the density and heat capacity of matter? As evidence from TIMSS indicates, these are important concepts for middle school students that are the basis for curriculum in the highest-achieving countries, but whether or not this Minnesota standard requires them is left up to individual teachers, assessment developers, parents and students.

- **The Profile is also inconsistent in its specificity and clarity. Most standards give too few specifics about the content students should learn, while others are too specific and essentially spell out classroom activities, learning strategies and tasks students are to perform.**

In Scientific Concepts and Applications, for example, some parts of the standards specify classroom tasks students must complete, while others provide only the broadest description of what students are to know. A student will, for example, at the high school level:

Demonstrate understanding of earth and space systems by investigating and analyzing earth systems through the interaction of forces and energy, geochemical processes and cycles, theories of the origin and evolution of the universe, energy in the earth system, and the historical significance of major scientific advances.

Our experts agreed that this overly broad list of topics does not provide enough guidance for teachers and schools, as it combines multiple distinct issues without delineating which advances, processes, cycles, theories and concepts are most important for all students to learn. Yet, in the same standard, students are instructed to:

Design and conduct one investigation through a problem-based study, service learning project, or field study by identifying scientific issues based on observations and the corresponding scientific concepts; analyzing data to clarify scientific issues or define scientific questions; and comparing results to current models, personal experience, or both.

This description of specific classroom activities specifies “how” students should gain the knowledge listed previously. While the list of what students’ investigations should focus on is nicely developed and focused, the requirement to conduct the investigations through a “problem-based study, service learning project, or field study” was considered by our reviewers to be too narrow and prescriptive. Our reviewers felt that determining the best activities to help students learn and demonstrate their knowledge of scientific topics is better left to teachers and schools.

This inconsistency exists not only across the learning areas and standards but within individual standards as well. In Social Studies, the standards on Citizenship generally were more clear and specific than any of the other standards in that learning area. But, within the high school standard for Themes of U.S. History, the list of topics runs the gamut from “the emergence of modern America” to “tribal sovereignty and the relationships between American Indian tribal governments and federal and state government.” These two topics touch on issues of a very different “grain size,” or level of specificity.

- **The Profile’s structure and organization may contribute to its lack of clarity and may make the standards harder for teachers and others to understand.**

Most of the standards consist of long, frequently run-on “stem sentences” listing the topics to be learned followed by a list of how to learn them. This structure often jumbles together many important concepts within one sentence, making the intent and focus of the standard confusing. The science standards listed above illustrate this problem, as do the high school standards for Reading, Listening and Viewing Complex Information. Students are to “demonstrate the ability to comprehend and evaluate complex information in varied nonfiction by reading, listening, and viewing varied English language selections containing complex information...” This attempt to combine multiple, distinct concepts into a single standard hinders understanding and can be frustrating to teachers, students and parents.

It is also unclear which grade levels the standards apply to. We encourage the state to ensure that all copies of the Profile include the grade levels indicated by “primary,” “intermediate,” “middle,” and “high school.” We understand why Minnesota originally chose not to do this, but given that the state now assesses the core academic areas in grades 3, 5, 8 and high school, it seems unnecessary to omit these grade levels. A second issue with format and layout is in the order of the standards. In the edition received by our expert reviewers, the standards are ordered starting with high school, then moving to primary, intermediate and middle school. If high school teachers are the sole audience for the document, then this order makes sense. But our understanding is that teachers, parents, and students at all grade levels are using the Profile, and most of our reviewers found this order unnecessarily confusing. Finally, the numbering or lettering of standards not only varies across learning areas but within standards. A consistent numbering system may make the Profile more user-friendly. These issues, while superficial, could have a significant effect on the ability of teachers, parents and community members to understand and use the standards.

2. Important Subject Matter

Our review uncovered serious gaps in the subject matter covered in the Profile. Due in part to the lack of clear and specific language, many important topics are not adequately described in the Profile of Learning. In addition, some are left open to interpretation and some are omitted completely.

- **English language arts**

In English, reading strategies, reading requirements and the writing process are underemphasized. While reading comprehension is mentioned, important strategies for comprehending literary or informational text are not specifically discussed, particularly in the early reading standards. Perhaps most importantly, the standards are silent on the quantity, quality and complexity of what students in various grade levels should be able to read. Nothing is mentioned about genres or types of children’s literature, for example, and the closest the standards come to specifying the level of material students should be able to read is the use of the term “age-appropriate.” Whereas other states address this issue by giving examples in the standards that include books, stories, plays, biographies, public documents and other nonfiction texts give a flavor of the level of reading expected of students at particular grade levels, Minnesota has provided no guidance to teachers or parents about what constitutes reading “on grade level.”

Other English concepts appear to have been omitted completely. For example, as they relate to the study of English language arts, research skills such as generating ideas and questions, gathering, evaluating, and synthesizing and crediting information from sources are omitted. Similar skills are listed in Inquiry and Research but not as they pertain to English language arts, and students may miss the opportunity to develop and practice the skills needed to engage in and write about research findings. This may unintentionally impact their performance in other subject areas, leaving them unprepared to evaluate the quality and credibility of facts, theories, data and arguments encountered in daily life.

➤ **Social Studies**

One of the most serious omissions occurs in the Social Studies standards. No specific historical events, people, concepts or topics are mentioned in this learning area until the high school level. The earlier grades instead focus on the fairly low-level “expanding environments” curriculum that assumes that young children are capable of learning only about the immediate world around them (their home, neighborhood, school, town and community). As a result, it appears that some students may reach the 9th grade without ever learning about the development of other world cultures, the American Revolution, Native Americans in Minnesota or other basic historical concepts. These students’ preparation for a solid sequence of history and civics courses in high school will be inadequate.

The Citizenship standards are more complete than other standards in Social Studies. The material that is included is important for all students, including citizenship, founding documents, rights and responsibilities, and how groups exercise power. However, the standard has an undue emphasis on rights and responsibilities, yet says nothing about the structure of the U.S. government and how power is allocated. Other serious omissions include the relationship of the U.S. to the rest of the world and other countries to each other; the ways nations interact; the influence of the U.S. on other countries, such as democratic ideals or being a force for human rights; leadership; the nature of constitutions and the forms of constitutional government; and the many other forms of government, particularly structures of foreign governments.

Similarly, while economics is included as a requirement in Economics and Business, many important economic concepts are lost in that standard's focus on economic systems and interactions. For example, there is no mention of fundamental concepts about the American economy, including gross domestic product, unemployment, interest rates, inflation and rates of growth — all identified as important by the voluntary national economics standards and by the standards of many other states.

➤ **Mathematics**

In Mathematical Concepts and Applications, important topics such as algebra and geometry are insufficiently detailed or sometimes completely missing. At the high school level, students must be able to identify rates of change in different models of linear relationships and know the characteristics of functions, but there is no specific mention of factoring and roots, division algorithms, the quadratic formula, or symbolic computations.

In the section on Shape, Space and Measurement, there is no mention of students applying the ideas of direction, distance and relative position of objects in space. One could also reasonably expect students to be able to recognize and use a core set of attributes such as length, capacity, weight, area and time, but this standard makes no such specification. These are essential concepts that our experts agree all students should master.

➤ **Science**

Several important topics in science also go unspecified. In the study of chemistry, no mention is made of naming compounds or electrochemistry. In biology, all dissection work and a survey of phyla are omitted. There is no history of science before high school and technology is inadequately addressed. The idea of science as inquiry is underdeveloped at the lower levels. As a result, students may be able to meet some of the standards in Scientific Concepts and Applications without knowledge of or experience with key concepts and processes.

3. Rigor and Progression

One of the main reasons states have been developing academic standards in recent years is to raise the level of teaching and learning for all students and encourage more reasoning and problem solving skills throughout all the content areas. While this goal is clear in Minnesota's standards, we are concerned that the standards are not rigorous enough to allow all schools to achieve this goal.

➤ **The standards' rigor is compromised by their lack of clarity and specificity, which has the potential to lead to wide variation in the depth of student learning across the state.**

As noted above, what the standards expect all students to know and be able to do is not always easily understandable. Leaving so many important concepts open to interpretation compromises the standards' rigor. Some schools may in fact interpret the standards very rigorously, while

others will not. If standards are to promote equity among students' educational opportunities, regardless of where they live, the standards must reduce the possibility of such wide variation.

Consider this example from Scientific Concepts and Applications: An intermediate standard calls for students to “demonstrate the ability to ... measure and classify objects, organisms and materials on the basis of properties and relationships.” One teacher could interpret this to mean that students should be able to collect and separate marbles based on their color, while another teacher may interpret the same statement to mean that students should be able to collect and classify insects from the playground based on the foods they eat. The difference in rigor is significant, yet both would meet the standard.

➤ **Additionally, many standards set low expectations and/or do not increase sufficiently in complexity as students grow older.**

In addition to the possibility of wide variation in interpreting the level of rigor, some standards use lower-level terms (according to Bloom's Taxonomy) in describing what students should know and be able to do. In Read, Listen, and View, for example, students are more often required to “identify” than to “evaluate” or “analyze” at the high school level. Other states expect students to engage in much more evaluation and analysis at that level.

Our experts also noted other cases where the progression of knowledge and skills demanded by the standards is inconsistent or inappropriate. In fact, some standards in the lower grades could potentially be interpreted more rigorously than the corresponding standard in a higher grade level. For example, at the middle level in Read, Listen and View, in nonfiction, students are asked in part 2) subpart D) to identify “differences in points of view of the authors when given more than one selection on the same topic.” The parallel statement at the high school level has students “identify bias, point of view, and author's intent,” and it is not clear whether they are to do this with more than one text. The middle school expectation is appropriately challenging, yet omitting multiple texts in high school does not logically build on what has been learned in middle school and may inadvertently undermine the high school standard's rigor. Other such examples are identified throughout the Summary Reviews.

4. Manageability and Focus

Manageable, focused standards reflect careful choices about what is the most important for all students to learn and when. Such standards avoid the pitfall of being “a mile wide and an inch deep.” This problem, noted by TIMSS researchers as being all too common in U.S. standards and textbooks, leads to fragmented learning because schools cover too many topics each year without ever going into sufficient depth and allowing students enough time to master the concepts. It is possible that by limiting the amount of content in the standards, Minnesota hoped to develop a set of standards that was concise and focused. In our judgment, however, that approach has not been entirely successful.

- **Our review found that having statewide standards in 10 areas undermines the standards’ focus and prioritization and creates artificial distinctions between some key skills and concepts.**

Minnesota departs from what most other states have done with the breadth of its 10 (now 11) learning areas. Most other states focused their work in standards-based reform on standards for English language arts, mathematics, science, social studies and, sometimes, world languages and the arts. This approach asks schools and districts to focus on student achievement in the core academic areas and allows more time to hone and refine alignment of standards, curriculum and testing in those areas.

The Profile of Learning sends a different signal — that all students must meet statewide standards in a variety of curriculum areas. While noble in its goal of broadening the learning experiences of all children, we are concerned that the Profile sacrifices depth of knowledge for breadth of topics, which may serve to de-emphasize the core subject areas — especially English language arts, mathematics, science and the social sciences — that other states and nations consider most essential. This breadth may also infringe on families’ and schools’ abilities to shape students’ curriculum choices, inadvertently limiting students’ opportunities to excel in the core subject areas. We note that adding an 11th learning area, Technical and Vocational Education, may further stretch schools and students away from the foundation subject areas.⁷

- **The Profile shows a strong commitment to interdisciplinary learning that also impacts the focus of the standards.**

While an interdisciplinary approach can be valuable, it often can be difficult to do well, and the research on its impact on achievement is inconclusive. As noted by one prominent researcher who favors progressive approaches to teaching and learning, interdisciplinary work can only be carried out legitimately after the student has become at least somewhat conversant in the relevant disciplines, and much of what is termed interdisciplinary work in the primary grades is actually predisciplinary work that draws chiefly on common sense.⁸ The interdisciplinary approach can also be difficult to implement, for example, when responsibilities for teaching particular content are not clearly delineated or in traditional departmentalized high schools.

The attempt to encourage interdisciplinary learning in particular by separating out the Learning Area of Inquiry and Research has the effect of separating the process of inquiry from the content knowledge it seeks to produce. While the notions embedded in the Inquiry and Research Learning Area are valuable, our experts noted some areas for improvement in the standards that could enhance their implementation in the classroom. Perhaps most significantly, separating Inquiry and Research out from the other learning areas may imply to some that Inquiry and Research experiences can and should be separated from the appropriate contexts in which they

⁷ Moreover, our review indicates that the topics that might be included in Technical and Vocational Education are already articulated in the learning area previously titled, “Decision Making.”

⁸ Howard Gardner and Veronica Boix-Mansilla, “Teaching for Understanding in the Disciplines — and Beyond,” *Teachers College Record*, V. 96, No. 2, Winter 1994, pp.198–218

should be learned. In contrast, Achieve and CBE believe that some skills in Inquiry and Research might be more appropriately distributed into Scientific Concepts and Applications or Social Studies, so that content and skills could be more situated in context. Moreover, some of the standards are redundant, such as Research Process, Social Science Process and Case Study. They are identical and could be combined into one standard. The same holds for Research and Create a Business Plan and Market Research.

The organization of the learning areas also has the potential to be confusing to educators and the public. In particular, why are key English language arts concepts and skills distributed among the three learning areas of Read, Listen and View; Write and Speak; and Arts and Literature? Our experts feel that this may actually diffuse any focus on reading, writing and other important literacy content and skills.

5. Public Support

Overall, Minnesota citizens support standards-based reform and a large percentage support the ideas behind the Profile. Several aspects of the Profile, however, over time may weaken the support it receives from teachers, parents and the public at large.

- **The Profile of Learning’s approach to teaching and learning, while innovative, is not balanced enough to ensure wide public support.**

There is little doubt that the Profile is progressive in its goals for student learning, and our interviews confirmed broad support for the goals of Minnesota’s standards and related reforms. In defining the Profile as it is currently written, Minnesota has made a unique and valuable statement about the kinds of skills and knowledge students should have. Those include higher-level thinking, problem solving and reasoning skills, as well as opportunities for applied and authentic learning. While there will always be voices calling for a swing of the pendulum “back to basics,” it is notable that many of the teachers and school and community leaders we spoke with support the ideas behind the Profile, even if they suggested areas for improvement.

However, Minnesota should be aware of the importance of a balanced approach, particularly in its encouragement of constructivist principles. While there may be research supporting such principles, there is an equal amount of research that concludes that a more traditional approach is also effective. A lesson learned from the experiences of other states is that whenever a set of standards or assessments follows the pendulum swing too far in one direction — whether it be toward a progressive view of education or a “back to basics” approach — they are more likely to have trouble with retaining public support and implementing the standards successfully. This has been evident in the “reading wars” and “math wars” that have taken place in several states. States are more likely to have strong, consistent, long-lasting policies when they embrace a more balanced approach, one that moderates between whole language and phonics in teaching reading, and one that emphasizes basic math skills along with more critical thinking and problem solving skills.

RECOMMENDATIONS FOR MOVING FORWARD

Our analysis points to a number of issues related to the overall quality and usefulness of the Profile of Learning as it currently stands. We believe that carefully addressing these concerns will significantly strengthen Minnesota's school reform efforts. In other states in which we have worked, we have sometimes recommended waiting for the normal revision cycle to make changes, or we have recommended that the state produce supplementary documents to "bridge" the standards and assessments and provide clarifying detail. In Minnesota's case, we recommend capitalizing on the commitment among government, education and business leaders to strengthen the Profile of Learning. Other states with which Achieve and CBE have worked have successfully infused the concept of "continuous improvement" into the revision of their standards, and that is the spirit with which we offer the following suggestions for strengthening the academic standards in Minnesota:

- ✓ **To strengthen the academic expectations for students and make them more meaningful to teachers and parents, Achieve and CBE recommend that the state revise the Profile of Learning to provide greater clarity, depth, focus, precision and rigor. We also recommend that the state consider reorganizing some of the learning areas and standards.**

In particular, we recommend adding greater specificity throughout the standards and integrating important skills and processes with the content students should learn. As other states are now learning, providing more detail and integrating content with skills need not mean that the state is infringing on districts' responsibility to develop and implement curriculum, which is the most appropriate and reasonable expression of local control.

We understand that other organizations, both governmental and independent, have recommended revising the academic standards by reducing the number of learning areas and standards that are required for high school graduation. We concur in principle that the Profile of Learning emphasizes breadth at the expense of depth, and that some of the public controversy over the Profile has been related to areas that are less central for the state to require all students to master. We advocate revising the standards related to English, math, science and social studies, and integrating the appropriate standards for inquiry and research into these subjects. Achieve and CBE believe that it is in Minnesota's best interest to focus at the state level on the core academic content areas. Otherwise, fleshing out the standards across all the learning areas to provide sufficient specificity and depth may produce a set of standards that are even more unmanageable

and that further minimize the core academic subjects. This does not mean that other subject areas should be removed from local curriculums, nor that Minnesota would be sending that message. It simply means that in order to provide guidance and leadership on what all students need to learn before they graduate, the state must make tough choices and set clear priorities.

We offer some specific suggestions for strengthening the standards, and other areas for improvement are detailed in the Summary Reviews. We can also point to examples from other state standards that have done a nice job balancing sufficient specificity with local control of curriculum, some of which are excerpted in Appendix A.

- Achieve and CBE suggest that the standards contained in Read, Listen and View; Write and Speak; and the literature component of Arts and Literature should be combined into a new English Language Arts Learning Area. This would help to emphasize the cohesive nature of that subject area and reduce the chances that some students will miss out on important foundational skills.
- Moreover, important content could be added to the standards pertaining to English Language Arts, particularly in the areas of early literacy, conventions and research. Achieve and CBE also believe that *all* students should be asked to master standards pertaining to academic and technical reading and writing, rather than making these core concepts and skills optional.
- The Mathematical Concepts and Applications standards could more clearly specify that all students will master the basic skills in elementary school (arithmetic, fractions and decimals, multiplication and long division, percentages and discounts, etc.). They should also describe a rigorous set of middle and high school standards that include algebra, geometry, measurement, advanced number concepts and statistics for all students.
- The high school standards for Scientific Concepts and Applications could be restructured and revised to include the content knowledge students will need and eliminate the repetition of process standards. More detail and specificity is needed throughout the K–12 science standards, and key concepts in biology, chemistry, earth science and physics that are not included should be considered for addition.
- The Social Studies standards should be augmented to require all students to learn key historical facts, ideas, concepts and skills in elementary, middle and high school. Learning about world history in addition to Minnesota and American history also should be required of all students. Standards for civics could be more explicit as well, closing the content gaps our review uncovered. The standards for economics, currently found in Economics and Business, might be more appropriately relocated to the Social Studies Learning Area and expanded to include key concepts they currently lack. Finally, all students should have the opportunity to undertake a more rigorous course of study in geography.
- Rather than having a separate learning area, the important content and experiences in the Inquiry and Research standards (e.g., the current standards relating to research process, math research, history of science, issue analysis, records of history, world history and cultures, etc.) could be incorporated in the appropriate content areas. Other process standards in Inquiry could be merged if they are redundant and moved to the relevant core content areas. By organizing topics with like topics rather than separating inquiry from content, Achieve and CBE believe the standards will not only be more manageable but also will strengthen instruction and result in deeper student understanding of the content.
- The state could incorporate ways to make the standards easier to read and follow, such as designating the grade levels or clusters (e.g., K-3 instead of primary), using a consistent

numbering format and editing long sentences into clearer, shorter statements. Changes such as these could make the standards easier to use and understand.

RESULTS OF THE POLICY REVIEW

In many ways, the quality of the standards in the Profile of Learning is tied inextricably to the policies and procedures surrounding the Profile. Therefore, we embarked on our review of these supporting policies to fit closely with the review of the Profile standards. Our analysis focused principally on the manageability and prioritization of the Profile of Learning, the ways in which progress in meeting the standards is measured, and incentives to meet the standards.

In the previous section, we discussed the quality of the Profile of Learning standards, including the breadth and depth of the content areas contained in the Profile. In this section, we have organized our discussion of the supporting policy issues according to the different components of the system for implementing the Profile:

- statewide assessment of student achievement;
- locally developed performance assessments;
- key elements developed by the state to support educators in implementing the standards;
- the Graduation Rule and system capacity and accountability; and
- maintaining strong public support for standards-based reform.

ASSESSING STUDENT ACHIEVEMENT OF THE PROFILE OF LEARNING

1. Having multiple opportunities and ways for students to demonstrate what they know and can do is admirable; this is a key strength of Minnesota’s system that should be preserved and built upon.

Minnesota’s assessment system combines “multiple measures” to assess student achievement of the Profile of Learning. The current system, particularly the Graduation Rule, relies heavily on performance assessment with an emphasis on local options. Schools and districts are responsible for measuring student performance on the Profile of Learning with locally developed and administered projects, activities, tasks and exercises. Local school boards and teachers decide which content standards from the ten learning areas in the Profile are required for student graduation. “Safety net” 8th grade statewide tests, the BSTs, are also required for graduation, and provide assurance that all students have at least the basic skills in reading, writing and mathematics needed to function in society. In addition, the state is currently developing the MCAs to measure system performance at the district level; tests are in place for reading, writing and mathematics in grades 3 and 5.⁹

This system provides for the use of several layers of tests, which provide many opportunities for students to demonstrate what they know and are able to do, rather than relying on one set of tests and attaching high stakes to them. In doing so, Minnesota may have avoided some of the issues

raised by critics of accountability in other states that have implemented a standards-based

⁹ Achieve will conduct a review of the quality and alignment of the MCAs to the Profile of Learning in reading, writing and mathematics for grades 3 and 5 during fall 2000. Results will be delivered to CFL in early 2001.

graduation test — in particular concerns that too much weight is given to a single high stakes test.

2. Past requirements associated with assessing the Profile of Learning and implementing the Graduation Rule were complex, costly and burdensome to many districts. Notably, many of these issues were addressed in the recent legislative session.

In addition to concerns about the quality and usefulness of the Profile of Learning standards, there has been tremendous controversy among educators, parents and students, and business and community leaders about the local assessments and related requirements. Minnesota has struggled to find the optimal way to assess achievement and hold students accountable for meeting the Profile of Learning standards.

Beginning in the mid-1990s, the state developed model “performance packages” that were aligned to individual Profile standards. Districts could also develop their own packages as long as they were equivalent to the state models. The packages typically involved extensive projects, some of which drew on knowledge and skills from other content standards. They often functioned as separate units outside existing course requirements, instead of being folded in to the local curriculum. The packages included multiple elements that students were required to meet. Teachers and students were asked to check off each element using checklists once students had mastered them.

Students’ completion of a content standard was determined according to state-developed scoring rubrics, on a scale of 1–4; again, rubrics could also be developed locally. A score of 4 was required to be equivalent to 3rd, 5th, 8th or 12th grade work, even if 7th or 10th grade students were able to complete the tasks. And, in accordance with the requirements of the Graduation Rule finalized in 1998, high school students beginning with the class of 2002 needed to demonstrate completion of 24 content standards in order to earn a high school diploma. (Students in the class of 2000 were required to pass the reading and math sections of the BSTs as a minimum graduation requirement.)

Moreover, schools and districts were responsible for keeping track of and reporting which Profile standards students had met and what score they received. Unfortunately, technology, time and resources to facilitate this record keeping have been scarce in many school districts. Many districts were maintaining dual transcripts for their high school students and recording seat time and other measures on the traditional transcript and Profile requirements on the other. The burden for tracking student proficiency often fell to individual teachers.

In May 2000, after three years of intense debate in the media and among policymakers, several steps were taken to revise the performance assessment requirements and the Graduation Rule. Many of the changes now codified in current law address the concerns raised by school officials and the public, and we commend the state for taking action to sustain standards and accountability in Minnesota. The new legislation contains a number of strengths:

- Schools and districts can now choose to use the state performance packages or develop their own measures to assess student proficiency against the Profile. This has helped to alleviate

some of the confusion and frustration over the content and quality of these packages.

- Many districts formerly interpreted the performance packages and assessment of the Profile as distinct from curriculum, in part because the packages included separate performance tasks and used state criteria rather than grades. This view — that standards should exist outside regular class work instead of driving improvements within the curriculum—compromises the goals of standards-based reform as a comprehensive tool for school improvement. We feel it needs to be adjusted, and the May 2000 legislation encourages this.
- Ninth grade students can now be graded compared to 9th grade work, instead of being limited to 12th grade work, in order to receive a “4” on local performance tools. This change will be particularly helpful to high school students and teachers.
- Districts now can use letter grades to evaluate student performance, provided those letter grades have been aligned with the scoring rubrics previously used to assign number scores. Students now can also receive a “0” or “F” on a content standard if work is not completed. This new option may make it easier for the public to understand the scoring system.

It was clear through our conversations with educators, school officials, business leaders and others that these changes have reduced what many perceived as the burden placed on schools by the Profile and the Graduation Rule. The bulk of control and responsibility for performance assessment is now at the local level, and many educators seem pleased to have greater flexibility to implement standards.

3. Although the legislation alleviates some problems, it leaves key challenges unaddressed. Most importantly, the legislation does not ensure that all of Minnesota’s students will be held to high standards and may impede efforts to reduce the achievement gap among Minnesota’s advantaged and disadvantaged students.

Although we applaud state policymakers for addressing issues causing controversy about the Profile of Learning, we are concerned that some of the other changes that occurred in the May 2000 legislation may ultimately harm the goal of common high standards in Minnesota. Previously, students were required to meet 24 of the 48 high school content standards under the Graduation Rule. Twenty-one of these were specified (although in many cases students could choose from a list of possible standards), and the other three were chosen by each student.

The responsibility to choose which standards will be required for students’ graduation is now in the hands of local school boards and teachers. If reducing frustration and easing the burden on local districts was the goal, this appears to have been a smart decision. Districts now have more time to carefully and thoughtfully implement the Profile and Graduation Rule. However, this flexibility comes with a significant price. By leaving the Profile totally up to local discretion, the state has effectively done away with a common high standard for all students beyond the BSTs. Now that local school districts can choose the number and distribution of standards that students must meet, some students may be held to higher standards based simply on the town or city in

which they live. In addition, because students are required to simply demonstrate *completion* of the content standards, rather than demonstrating a certain degree of *proficiency* in the learning areas, it is not clear that the state has set common high standards for student achievement. Making the granting of diplomas contingent on such disparate measures means, in effect, that there is no common definition of what it means to be a high school graduate in this state, beyond the safety net provided by the BSTs. It also may open up the state to lawsuits.

Are state leaders comfortable with some children being expected to learn only the basics while others are expected to learn much more? In our view, this is exactly what the standards movement was designed to help us avoid — high expectations for some, low expectations for others. Experience has shown us that in such a system, poorer students in urban and rural communities and children with special learning needs are the ones who lose out.

Our analysis of the data recently collected by CFL and the legislature indicates that just over 40% of school districts have opted to continue requiring students to meet the state default requirement of 24 content standards. Most school systems have pushed back the year that the Graduation Rule will take effect until the class of 2004. And over 180 districts are requiring fewer than 23 standards, with four districts requiring zero standards for high school graduation.

More critically, a significant number of school districts, particularly those located in areas with economically and educationally disadvantaged students, have substantially reduced their requirements. St. Paul will eventually require students to complete 17 standards, while Minneapolis and Rochester elected to require 12 standards. The situation is similar in more remote areas of the state: A solid proportion of the districts that have chosen to implement fewer than 12 standards are located in rural areas.

Because of these disparities, Achieve and CBE are concerned that the system may be unfair to students. Is it fair that some only need to meet 10 standards, when those just across the highway in a different district will need 20? What would happen if an 11th grade student moved from the district with 10 standards to the district that requires 20 for graduation? How will parents know that their children are graduating with the knowledge and skills they need to succeed in society? How will employers such as 3M, General Mills, Red Wing Shoes, Best Buy and Honeywell know if high school graduates are qualified to fill their entry-level jobs? And how will colleges be assured that students are prepared for college-level courses, and that they won't need remediation in writing and math?

Our conversations with Minnesota stakeholders have led us to believe that most Minnesotans support common high standards for all students and value the flexibility that is now afforded by current state policy. Yet even supporters of current state education policy do not believe that a system of common high standards is now in place. The reliance on local performance assessment results in excessive variation from district to district, leaving unanswered the question of whether

all students are learning the skills and knowledge they need. This is a difficult conundrum — and one that state policymakers must address head-on.

4. We are concerned that the power of local performance assessments will be diminished because it is likely that their quality will vary considerably across the state.

The responsibility to develop, administer and score performance assessments to measure student achievement of the standards and to track students' progress on these measures is now firmly placed with individual teachers, schools and districts. This emphasis on local decision making for assessment and accountability gives substantial flexibility to school districts, but it may place too great a burden on educators, principals and district officials. A common theme heard throughout our interviews was that building capacity at the school and district level to deliver on the Profile of Learning standards as well as the performance packages is a critical issue across Minnesota. We are concerned that many of the state's 300-plus school districts do not have the capacity to carry out the state's ambitious reform agenda as it is currently formulated, and that students might suffer as a result of the inequitable distribution of this capacity.

We heard from many educators that locally developed, performance-based activities and tasks offer great potential to improve teaching and learning. Most of the teachers, principals, superintendents and school board members with whom we spoke value these assessments, and they spoke highly of the professional development opportunities that creating new local measures will afford. They also recognize that the emphasis in performance tasks on hands-on learning opens new doors to many students.

However, these same educators also acknowledged that the quality of the local tools could very well be uneven across schools, districts and the state. In larger districts, teachers can collaborate to develop performance projects, but small, single-building schools and districts may not always have enough time and capacity to create rigorous and substantive activities. Developing useful, efficient, reliable performance assessments that provide good feedback to teachers and students is always a challenging task, one that states have struggled with over the years. Achieve and CBE are not confident that the performance tools created locally to measure achievement of the Profile of Learning will always be valid and reliable. Nor are we convinced that the level of rigor and what constitutes acceptable achievement will be consistent across the state's 300 districts.

5. Some of the elements that support local performance assessments will need to be strengthened in order to ensure that all students engage in challenging and meaningful work.

First, the state-developed scoring rubrics have the potential to be a useful tool in locally assessing student performance on standards. However, for the most part, our review found that these rubrics are not specific enough; currently, they are written for each learning area instead of for specific standards or specific tasks. Also, some use identical descriptors for student work at different grade levels. This is in contrast to research and best practice on the use of rubrics, which indicate that to improve teaching and learning they should be specific enough to provide good information on particular tasks and problems, yet broad enough that students and teachers can see the development of skills and knowledge across tasks. And, there appear to be multiple versions of the rubrics available; the ones available on the Department Web site, for example, do not always match the ones used in training videos. Therefore, we suggest that the state refine the

rubrics to provide more detailed descriptions of what it means to meet each standard at each grade level. We can point to examples from other states if this would be helpful.

Second, we reviewed the curriculum frameworks as policy documents developed to support schools and districts in implementing the Profile of Learning. We found that the frameworks do not necessarily improve upon the weaknesses we noted in the Profile standards. Taken as a whole, they are not as informative about what students should know and be able to do as they probably need to be given their role as documents to support educators in creating curriculum. While the curriculum frameworks contain elements that would certainly be useful to teachers (such as additional information about content, teaching examples and teaching strategies), they contain just as many that could potentially be confusing such as overly broad alignment to the standards; categories that are different than those used in the standards; or even different standards than the ones in the Profile.

The curriculum framework for social studies, for example, provides a chart to show alignment with the national standards. However, it uses part B of the high school history standard, “a student shall demonstrate an understanding of themes and illustrate the influence of diverse ideals or beliefs of an era in the historical development of the United States,” to align to the national standards from the National Center for History in the Schools pertaining to historical analysis and interpretation, historical research capabilities, and historical issues-analysis and decision making. The alignment is not made particularly clear. Additionally, this standard does not match the one in the Profile made available to the review team. Some additional detail about topics and content matter is provided, but it is not clearly articulated. The mathematics framework does provide additional information about what students should know and be able to do, although the categories for that information do not always align with the standards in the Profile. For example, the grade clusters are different from in the Profile (primary is K–2 instead of K–3); this can be confusing to teachers.

Third, the beginnings of policies to harness technology as a helpful tool in Minnesota are in place. For example, the state has developed videos that describe lesson plans and student work to meet the standards. Video is an extremely useful tool in teacher training and is used increasingly in districts and states. While helpful in giving teachers ideas about what standards-based instruction might look like, however, some of these videos leave out important components. For example, not enough time is spent actually viewing the student work and discussing why it received the score it was awarded. The exemplary student work is mentioned, but viewers have little opportunity to see the work itself. The videos also give several examples of where it took several months to complete a task that met the requirement for one part of one standard. While this could be the case, it creates the impression that all parts of all standards take several months to complete, making the standards seem more complex than they need to be. This could contribute to the overwhelmed feeling experienced by many districts and teachers.

Fourth, it is not clear to us that the concerns expressed across the state about the lack of technology and resources to maintain student records were addressed in the May legislation. This issue deserves additional attention. The 1–4 scoring system has been confusing for teachers as well as burdensome. The reality that most districts have kept two separate transcripts for students may hinder the goals and intent of the Graduation Rule. While the state has been responsible for

distributing a record keeping software system to facilitate this, most districts seem to think that these efforts have not been sufficient to date; indeed, most record keeping is still done tediously, on paper. To ensure that the data from the local performance assessments contribute to the state's system of multiple assessment measures, we encourage the state to address this issue and provide adequate software options for districts.

On another issue, we are concerned that there may be confusion about how best to integrate the Profile standards into local curriculum. At present in Minnesota, the Profile tends to stand outside the curriculum. In many districts, standards can only be met in certain courses; this has made scheduling for some students quite complicated. For example, prior to enacting the spring 2000 legislation, newspaper articles cited cases where students were unable to meet the Profile's biology requirement in Advanced Placement Biology and instead had to take regular biology or "greenhouse management," as one individual told us. While Advanced Placement work now can satisfy the Profile requirements, the issue of standards not being fully integrated into courses could still remain. All biology courses should reflect the goals of the state standards for biology, not just some. Yet it is unclear whether schools offer the standards in all biology courses. Similarly, in some classes, students might spend three weeks working on a performance task to meet all or part of a specific standard, yet those three weeks are the only time they spend on "standards." The goal of standards is to improve and enrich teaching and learning, which means that coursework across the board should be standards-based. Without this systematic approach, the value of setting high standards is compromised. While some schools and districts may be moving to ensure that the standards help revitalize curriculum and not infringe on it, the current structure of the Profile standards and the graduation requirements may be causing too much confusion about the best ways to implement standards and measure achievement.

ACCOUNTABILITY FOR ADULTS: A SYSTEM TO SUPPORT HIGH STANDARDS

6. In our view, Minnesota should complement the Graduation Rule requirements for students with a firm but fair accountability system for adults that incorporates assistance, incentives and consequences.

One thing that has become increasingly clear to states involved in standards-based reform is the importance of reciprocal accountability: It is unfair to hold students to high standards until we know that the system has provided them with the necessary opportunities to meet those standards. Good accountability systems serve not only academic excellence but also equity, by providing leaders with information about low-performing schools and students, and the feedback necessary to improve. Accountability for adults includes teachers, principals, district officials, school board members, teacher preparation institutions, state policymakers and others. In our

experience working with states, comprehensive accountability systems include the following key elements:¹⁰

¹⁰ A short discussion of these issues is included in the briefing book *Achieve* prepared for the 1999 National Education Summit. The briefing book is available at www.achieve.org.

- *Student incentives and assistance*, such as graduation exams and college scholarships for strong performance on the exams;
- *Report cards* developed by the state that document achievement and other information about schools and districts;
- *Ratings* that classify schools based on achievement (either by absolute performance or by annual growth targets);
- *Assistance* for low-performing and average schools to help them improve;
- *Rewards* for highly successful schools, such as monetary bonuses and freedom from bureaucratic regulations; and
- *Sanctions* for chronically failing schools, including takeovers, reconstitution and closing failed schools.

In our analysis, Minnesota has in place just two of these six essential accountability elements — student incentives and school report cards. Publicizing achievement and demographic data is a necessary first step, one that over 35 other states have taken, and we applaud the state for informing the public about the performance of all public schools, including charter and alternative schools. However, it is not clear how much change these report cards alone can spur; other steps will likely be needed to hold the system accountable for higher performance. We encourage Minnesota to examine promising policies from other states to inform the development of additional accountability structures that include the remaining elements described here.

➤ **Assistance to Low-Performing Students**

Research and practice continue to show that accountability systems for adults keep students from falling behind in the first place. We encourage education leaders in Minnesota to work with schools and districts to ensure they have strategies to intervene early when students fall behind and provide remediation, extra help and extra time for students to meet high standards. Nearly 20 states require districts to intervene and remediate students in danger of not meeting standards, and many of them provide funding to do so.

Good assessment practices at the local level can give teachers ongoing, useful information about how students are doing, and where and why they might need extra help. Districts should encourage the use of such practices; the local performance activities are a natural way to evaluate students' progress toward meeting standards. Information from statewide and local assessments should be used to identify struggling students and intervene when students start to fall behind. There are a wide variety of intervention strategies that provide children with additional targeted instruction, including tutoring and after school programs, summer school, Saturday school and time within the school day to make sure that all children have every chance to meet the high standards their state has set for them. New strategies now in place in Boston and San Diego are particularly promising models.

➤ **Identification and Assistance of Low-Performing Schools**

Because most stakeholders with whom we talked identified capacity as a key issue confronting Minnesota schools, it may be that the state's efforts should focus on identifying the lowest-performing schools and helping them improve. Kentucky and Washington have two admired programs for helping schools reach high standards that involve ongoing educator assistance and professional development. Texas' accountability system requires all schools, no matter how well they are doing, to close the achievement gap among white, minority and poor students. It also sets targets for growth for all schools that rise each year to push for constant improvement. North Carolina's system takes into account the demographic make-up of each school, identifies annual improvement targets for all schools and distributes millions of state dollars to schools that exceed these targets. School staff decide how to use the money (for example, for purchasing books and supplies, or for teacher and principal bonuses). In each of these states and in many others, the emphasis is on helping all students reach standards by setting high expectations of students and adults, and providing incentives and assistance to improve the system.

➤ **Rewards and Sanctions**

In our view, Minnesota currently does not have the foundation structures needed to implement incentives and consequences for schools and districts. Before such a system is put in place, statewide standards and tests will need to be revised and strengthened. Ultimately, however, we encourage Minnesota to extend accountability to adults. Otherwise, the responsibility to achieve higher standards will fall too much on the backs of students alone.

7. In recent years, Minnesota has begun to invest in schools' and districts' capacity to teach to higher standards; we encourage the state to continue and expand these efforts.

To hold students accountable for their learning and the system responsible for student performance, states must be able to assure the public that teachers have had ample opportunity to be trained in what they teach; that school districts have a strategy for providing ongoing, sustained high-quality professional development; and that all schools have aligned curriculum materials and technology.

➤ **Training and Professional Development**

The state has already begun to provide extensive and comprehensive training for teachers on the Profile of Learning. Training also has been provided to implementation technicians in every district. Minnesota should continue and expand these programs, incorporating continuous feedback to ensure that these training initiatives meet the needs of districts and teachers. The best practices networks also have potential to build the capacity of the teaching force by giving teachers the best kind of professional development: the opportunity to work with and learn from each other with a focus on content knowledge and how to teach it effectively.

While these practices should be continued and expanded, we also recommend that the state

consider developing a cadre of expert educators who can be deployed to assist schools that are identified as low-performing. Such teams will be able to help teachers and principals in troubled schools to make changes in curriculum, instruction, professional development and school organization that are necessary to raise student achievement.

➤ **Technology**

In many states, technology is becoming invaluable in implementing high standards and improving teaching and learning. The Internet can serve as a network for teachers to communicate, and some schools and districts across the country and the world have utilized the Internet to examine and compare performance data, and showcase and discuss student work. Technology is also vital to effective record keeping systems and managing information. While such systems do not have to be state-run, it is important that district systems be compatible with the state's systems.

CFL has a Web site that has the potential to be an extremely useful resource for teachers, parents, students and districts. The site contains, for example, the scoring criteria that have been developed thus far and continuous improvement pages documenting school performance and demographics. CFL has been asked to continue to develop its Web site as a repository for curriculum and other resources. Achieve and CBE encourage CFL to continue and expand it to include links to other curriculum resources, exemplars of student work, and sample lesson plans and assessments. This should help create an online community of teachers across Minnesota.

However, the state must continue to ensure that all schools and districts have the infrastructure to take advantage of these many technological benefits. Some schools have no access to computers or the Internet; others may have Internet access, but only in one computer for the entire district. Until all teachers and administrators have access to these technologies (and the training on how to use them), there will be gaps in the implementation of standards-based reform that will likely relate to inequities among economically advantaged and disadvantaged communities.

STRENGTHENING PUBLIC SUPPORT FOR HIGH STANDARDS

8. Minnesota stakeholders support standards-based reform, and the state should take steps to ensure that that support is strengthened and sustained in the coming years.

Perhaps one of the most important findings in this report is one that we came across only indirectly, as a result of our stakeholder interviews. While there might be much debate in Minnesota about the details of standards-based reform policies, there is strong support across the various constituencies for a system of statewide standards. This has been a key ingredient of successful reforms in other states.

The states that made the most progress in raising student achievement during the 1990s — Colorado, Connecticut, Maryland, North Carolina and Texas — typically had at least two things in common: They systematically pursued a coherent agenda built around higher standards, more rigorous assessments and clearer accountability for results; and they had broad-based, sustained

political leadership for reform. Sometimes this leadership came principally from an education-minded governor or a highly respected state superintendent, but often there was a business-led coalition that provided forceful advocacy for reform as well as stability and continuity during periods of political transition.

In our judgment, it is critical that the governor, commissioner, and key legislative and business leaders harness the core support we witnessed during our interviews and build a broad-based coalition committed to strengthening education standards in Minnesota while staying the course on the principles of standards-based reform. This coalition must communicate clearly the goals and continued need for school reform; the successes of students, schools and districts in reaching high standards; and that school reform should be approached as a continuous improvement process.

Other states have found that a nongovernmental, nonpartisan coalition can best carry these messages. These groups have been highly successful in building public engagement campaigns and providing the general public with solid and useful information about high standards. We can provide more information about organizations in states such as Kentucky, Massachusetts, Maryland, New Jersey, and Washington, if Minnesota is interested.

RECOMMENDATIONS FOR MOVING FORWARD

Our conclusions regarding Minnesota's assessment and accountability policies merit special attention. In addition to the changes to existing policies and program elements we outline in this section, we recommend that the state strengthen its accountability policies for students and adults and strengthen public support for higher standards.

- ✓ **We believe that the best way to ensure that all Minnesota's students are held to high standards is to have a statewide measure of student achievement. We encourage the state to examine best practices from other communities and states to design such a system, focusing on the core academic subjects.**

Our findings regarding the quality of the Profile standards and the potentially detrimental structure of the locally driven assessment and accountability measures have led us to conclude that the state should take greater responsibility for assessing student achievement with common, rigorous measures. The BSTs have been a useful tool in highlighting students who need greater attention and better educational opportunities. However, the BSTs are not intended to be a test of rigorous, end-of-high-school standards; indeed, they may be within the reach of some 5th grade students. Other states with a tradition of basic skills graduation tests are now moving towards more challenging graduation tests. No state currently has a test based on standards below 8th grade that is used for high school graduation; some have moved instead to make their basic skills tests a gateway to high school.

Given that local schools' performance activities will vary in quality and rigor — and that the state's only common assurance about student readiness for life after high school is a test of basic literacy — we recommend that Minnesota develop statewide assessments for high school that

measure student performance on the Profile of Learning. The elementary school MCAs have laid the groundwork for such a system.¹¹ And because the high school MCAs are not yet fully developed, the timing is right to make any adjustments in the high school testing program that may be needed. Such a statewide assessment would provide a common yardstick for measuring student achievement and would reduce the chance that some students will be held to lower standards than other students. It would also eliminate the frustrations or potential errors inherent in requiring districts to track, record and report on local performance assessments to meet the strict legal requirements needed when students who don't meet the standards are not given diplomas.

Not all learning areas or standards can be appropriately measured at the state level, and creating too many tests would be intrusive and disruptive for schools. However, we believe that core academic areas, particularly English language arts, mathematics, science and social sciences, should be assessed at the state level. Some areas, such as the arts, world languages, and the skills of listening and speaking in English language arts, are sometimes more difficult to efficiently assess with on-demand tests, but several states have developed common measures in these subject areas. Other areas, such as health, physical education and career preparation are more appropriately assessed locally.

There are different approaches to developing a statewide high school assessment system. Some states have used an "end-of-course" approach, developing multiple tests that tie closely to required courses in the core academic areas and requiring students to pass a certain subset of these tests. Other states have developed a series of high school tests that are given for the first time at a specific point in a student's high school career — such as the end of 10th or 11th grade — and cover multiple subject areas. Students then have multiple opportunities to meet the standards if they do not pass on the first try. With either approach, the goal is to guarantee that all students are meeting high expectations.

We recognize that assessing rigorous standards is one of the most pressing issues faced by states today, particularly given the need for students to be knowledgeable in the core academic subjects and also possess the kinds of 21st century skills embodied in the Profile (such as critical thinking, problem solving, and communicating effectively). We also know from experience that statewide tests can involve multiple ways for students to "show what they know," and that moving to a system of common high school tests does not mean that Minnesota will need to retreat from performance assessment.

We recommend that in creating the high school MCAs, Minnesota build on the best practices from states that are experienced in implementing statewide assessments. Some state tests use multiple-choice items, short answer problems and extended tasks such as writing essays, solving meaningful math problems or performing science experiments. Such tests are in use throughout the country. Pencil-and-paper tests in Washington, New Jersey and Rhode Island are strongly

¹¹ We understand that the MCAs are currently intended as tools to measure system performance at the district level, but that results for individual students are provided. After Achieve's analysis of the MCAs is completed in early 2001, we will know more about the existing tests' usefulness for determining whether elementary and middle school students have mastered the Profile standards.

performance-based; evidence is beginning to mount that teaching and learning throughout these states is changing for the better.¹² In Maryland, where statewide performance assessment has been in place for nearly a decade, students engage in applying knowledge to problem solving situations, sometimes in groups. Oregon has an aligned school-district-state system that incorporates knowledge and skills tests, on-demand performance assessments, and classroom work samples that are collected by the state. These are just some of the different approaches states are taking to ensure that all students are held to common, rigorous and meaningful standards.

Minnesota should choose the approach to statewide testing that will fit best with local and state needs. In any case, the key issue in developing new high school tests will be to ensure that the tests measure the rigor, breadth, and depth of the content knowledge and performances in the revised state standards.

- ✓ **Once the new statewide assessments are developed, Achieve and CBE believe the best way to ensure that all students achieve high standards will be to revise the Graduation Rule, taking care to phase in the graduation standards over time.**

Just as it is imperative that the state take responsibility for developing high-quality assessments to measure high standards, it is also critical that the state provide leadership regarding the standards all students need to achieve before graduating from high school. We are concerned that, although they have great value in enhancing teaching and learning, the locally driven performance assessments are insufficient as a primary tool for student accountability. The fairness and equity issues we discussed above come into even sharper focus when students are asked to be accountable for mastering what in effect are 300 different sets of standards. We suggest revising the Graduation Rule to use results from the common statewide tests in English language arts, mathematics, science and the social sciences as the primary indicator of whether students are prepared for the demands of life after high school and thus are qualified to earn the state diploma.

We believe that a revised Graduation Rule can and should be phased in over time. One successful strategy other states are employing is to begin by requiring students to achieve high standards on the tests first in English and mathematics, and add science, social studies and other subjects after teachers, parents and students have had time to become accustomed to the first statewide assessments. Phasing in requirements allows for adequate time to develop quality measurement tools and mechanisms for reporting the results in meaningful ways to parents and teachers. It gives local districts and schools time to align resources and curriculum and develop teacher capacity in order to deliver rigorous, focused and rich learning experiences to all Minnesota students. And most importantly, it helps ensure that all students are given adequate time in a standards-based system to learn the essential knowledge and skills in the core subject areas.

¹² See, for example, reports on teaching and learning from New Jersey and Washington state, cited in the references.

A fair graduation requirement for students might include a combination of results from the statewide test and student data from local projects to supplement those results. A growing number of communities and states are beginning to explore such methods, and we could provide more information if the state is interested.

We believe the details of the revised Graduation Rule are best left to Minnesota policymakers, educators and citizens, but, at a minimum, we urge the state not to hold students accountable solely for merely completing local tasks and activities.

✓ **The state should move toward a more comprehensive system that not only holds students accountable for their performance but schools and districts as well.**

Over the next few years, while the standards are being revised and the statewide tests are being developed, we believe that Minnesota should focus its efforts on developing ways to identify schools in which students are not achieving standards, schools that could do better and schools whose performance is exemplary. A comprehensive accountability system would also include funding for districts to assist struggling students, assistance to low-performing schools to help foster improvement, and the recognition of excellence among schools that exceed expectations and achieve at high levels.

At the same time, the state would do well to continue building capacity at the local level to implement rigorous high standards. This includes training and technology systems to ensure that educators at every level in Minnesota's education system have the resources and support they need to provide every student with rigorous, meaningful educational experiences.

Once appropriate structures for identifying and assisting schools are in place, Minnesota should investigate promising practices with regard to rewards and sanctions in states that have implemented comprehensive accountability systems. In our experience, establishing real adult accountability for results has provided the necessary incentives help the education system improve and to help ensure that all students graduate from high school with the knowledge and skills they will need to succeed.

✓ **State government, education and business leaders should undertake some important steps to communicate clearly the goals and policies of reform to key audiences.**

Despite our favorable impressions about public support for higher standards, there is evidence that key members of the public, including parents, teachers and school officials, have grown weary of the Profile's complexity and scope. The Profile has been under development since at least 1993, and it and the policies surrounding it have been a source of intensive public debate from its inception.

Thus, as the state makes improvements to the Profile and related policies, it must continue to build and sustain public support for education reform. Our experience in other states has provided us two key lessons: support for higher standards must be consistently upheld by leaders

across the public and private sectors, and continuous communication with the public is essential.

We urge state policymakers to work with educators, parents, and business and community leaders to make the necessary improvements and changes while staying the course on the general principles of standards-based reform. The state needs to communicate its goals and the details of the reform policies more clearly to various members of these communities. Other states have found that a nongovernmental, nonpartisan coalition can best carry these messages. These groups have been highly successful in building public engagement campaigns and providing the general public with solid and useful information about high standards. However Minnesota decides to move ahead with improving the Profile of Learning, the improvements and the goals of reform must be communicated clearly and consistently to the public.

CONCLUSION: SUSTAINING STANDARDS-BASED REFORM

Minnesota has made significant strides in developing a standards-based system: The state has begun the hard work of implementing standards in the classroom. Multiple measures of the standards are in place or under development. Elements of accountability for students and public schools are in place; public awareness of the reforms is extremely high. And public support for raising achievement remains strong. In addition, Minnesota's government and education leaders are committed to refining and continuously improving the standards and supporting policies; a new advisory panel will have responsibility for biannually evaluating the quality of the Profile and recommending changes to the commissioner.

To sustain this support and to achieve the ultimate goals of equity and excellence in Minnesota's schools, the state will need to attend to the findings and recommendations in this report. The state has an opportunity now to reflect on the lessons from early implementation of the Profile of Learning and couple those lessons with our in-depth analyses. We urge the state to take strong action to improve the Profile of Learning and Minnesota's assessment and accountability policies to ensure that these reforms are a strong enough foundation for the hard work of improving teaching and learning across the state.

Standards-based reform is at a critical juncture in Minnesota. While the changes outlined in this report might seem to some like a change in course, they are really about staying the course of standards-based reform. Minnesota's commitment to excellence in education is strong and unqualified. By taking important steps to refine the Profile of Learning, that commitment will help prepare all students for the challenges that await them in a new century.

* * *

Achieve and CBE are grateful for the cooperation and support Minnesotans provided to enable us to conduct this analysis. We hope that the information we have provided in this report is helpful to Minnesota as the state continues to work toward a higher-performing and more accountable education system.

APPENDIX A:
EXCERPTS FROM EXEMPLARY STANDARDS

INDIANA ACADEMIC STANDARDS FOR ENGLISH (EXCERPTED)

Grade 7 Standard 2

READING: READING COMPREHENSION (FOCUS ON INFORMATIONAL MATERIALS)

Students read and understand grade-level-appropriate material. They describe and connect the essential ideas, arguments, and perspectives of the text by using their knowledge of text structure, organization, and purpose. The selections in the *Indiana Reading List* illustrate the quality and complexity of the materials to be read by students. At Grade 7, in addition to regular classroom reading, students read a variety of grade-level-appropriate narrative (story) and expository (informational and technical) texts, including classic and contemporary literature, poetry, magazines, newspapers, reference materials, and online information.

Structural Features of Informational and Technical Materials

7.2.1 Understand and analyze the differences in structure and purpose between various categories of informational materials (such as textbooks, newspapers, and instructional or technical manuals).

7.2.2 Locate information by using a variety of consumer and public documents.

Example: Choose a radio or watch to purchase, based on a *Consumer Reports* review of different radios or watches. Then, compare advertisements from different stores to decide which store is offering the best price.

7.2.3 Analyze text that uses the cause-and-effect organizational pattern.

Example: Use a comparison chart, such as a T-chart, to illustrate causes and effects.

Comprehension and Analysis of Grade-Level-Appropriate Text

7.2.4 Identify and trace the development of an author's argument, point of view, or perspective in text.

Example: After reading a piece of historical fiction, such as *When Justice Failed: The Fred Korematsu Story* by Steven A. Chin about the internment of Japanese Americans during World War II, describe the author's perspective on the events described and how the author demonstrates this point of view throughout the text.

7.2.5 Understand and explain the use of a simple mechanical device by following directions in a technical manual.

Example: Follow the directions for setting a digital watch or clock.

Expository (Informational) Critique

7.2.6 Assess the adequacy, accuracy, and appropriateness of the author's evidence to support claims and assertions, noting instances of bias and stereotyping.

Example: React to a persuasive, nonfiction text, such as a letter to the editor, by asking questions that the text leaves unanswered and challenging the author's unsupported opinions. Evaluate the accuracy and appropriateness of the evidence presented in a book, such as *Lives of the Writers* by Kathleen Krull.

Grade 7 Standard 3

READING: LITERARY RESPONSE AND ANALYSIS

Students read and respond to grade-level-appropriate historically or culturally significant works of literature that reflect and enhance their study of history and social science. They clarify the ideas and connect them to other literary works. The selections in the *Indiana Reading List* illustrate the quality and complexity of the materials to be read by students.

Structural Features of Literature

7.3.1 Discuss the purposes and characteristics of different forms of written text, such as the short story, the novel, the novella, and the essay.

Example: Describe a short story as a piece of prose fiction usually under 10,000 words and provide an example, such as "The Night the Bed Fell" by James Thurber. Describe a novel as a prose narrative of considerable length and provide an example, such as *The Westing Game* by Ellen Raskin. Describe a novella as a short novel and provide an example, such as *The Gold Cadillac* by Mildred Taylor. Describe an essay as a short piece of writing on one subject or theme and provide an example, such as an essay by Ralph Waldo Emerson.

Narrative Analysis of Grade-Level-Appropriate Text

7.3.2 Identify events that advance the plot and determine how each event explains past or present action or foreshadows (provides clues to) future action.

Example: While reading *The True Confessions of Charlotte Doyle* by Avi, recognize the foreshadowing of events to come when Charlotte Doyle boards the boat for her 1832 transatlantic voyage and the ship's cook slips her a knife.

7.3.3 Analyze characterization as shown through a character's thoughts, words, speech patterns, and actions; the narrator's description; and the thoughts, words, and actions of other characters.

Example: Describe the main character in *Out of the Dust* by Karen Hesse, using examples of her thoughts, words, and actions to support this description.

7.3.4 Identify and analyze themes, such as bravery, loyalty, friendship, and loneliness, which appear in many different works.

Example: Analyze the theme of loneliness that is present throughout *The Islander* by Cynthia Rylant. Relate the theme to other works that have been read in class and for pleasure.

7.3.5 Contrast points of view, such as first person, third person, limited and omniscient, and subjective and objective, in narrative text and explain how they affect the overall theme of the work.

- First person: the narrator tells the story from the “I” perspective
- Third person: the narrator tells the story from an outside perspective
- Limited narration: the narrator does not know all thoughts of all characters
- Omniscient narration: the narrator knows all thoughts of all characters
- Subjective: the point of view involves a personal perspective
- Objective: the point of view is from a distanced, informational perspective, as in a news report

Example: Understand that the point from which the writer has chosen to tell a story affects the impact of the story on the reader. Discuss how the point of view of a book read in class affects the theme of the book, and explain how this might have been changed had the story been told from the point of view of another character or from an all-knowing narrator.

Literary Criticism

7.3.6 Compare reviews of literary works and determine what influenced the reviewer.

Example: Compare multiple reviews of the same book, such as *The Yearling* by Marjorie Kinnan Rawlings, *Souder* by William Armstrong, *The Monsters Are Due on Maple Street* by Rod Serling, or *And Then There Were None* by Agatha Christie. Decide what in each book seemed to influence the reviewer.

Grade 7

Standard 4

WRITING: WRITING PROCESS

Students discuss, list, and graphically organize writing ideas. They write clear, coherent, and focused essays. Students progress through the stages of the writing process and proofread, edit, and revise writing.

Organization and Focus

- 7.4.1 Discuss ideas for writing, keep a list or notebook of ideas, and use graphic organizers to plan writing.
- 7.4.2 Create an organizational structure that balances all aspects of the composition and uses effective transitions between sentences to unify important ideas.
- 7.4.3 Support all statements and claims with anecdotes (first-person accounts), descriptions, facts and statistics, and specific examples.
- 7.4.4 Use strategies of note-taking, outlining, and summarizing to impose structure on composition drafts.

Research and Technology

- 7.4.5 Identify topics; ask and evaluate questions; and develop ideas leading to inquiry, investigation, and research.
- 7.4.6 Give credit for both quoted and paraphrased information in a bibliography by using a consistent format for citations.
- 7.4.7 Use a computer to create documents by using word-processing skills and publishing programs; develop simple databases and spreadsheets to manage information and prepare reports.

Evaluation and Revision

- 7.4.8 Review, evaluate, and revise writing for meaning and clarity.
- 7.4.9 Edit and proofread one's own writing, as well as that of others, using an editing checklist or set of rules, with specific examples of corrections of frequent errors.
- 7.4.10 Revise writing to improve organization and word choice after checking the logic of the ideas and the precision of the vocabulary.

MASSACHUSETTS CURRICULUM FRAMEWORK — ENGLISH LANGUAGE ARTS (EXCERPTED)

LITERATURE STRAND

Learning Standard 8

Students will decode accurately and understand new words encountered in their reading materials, drawing on a variety of strategies as needed, and then use these words accurately in speaking and writing.

| Grade | Standard | Examples |
|------------|---|---|
| 5-8 | Use their knowledge of Greek and Latin roots as well as context clues and glossaries to understand the specialized vocabulary in the content areas, and use these words accurately in speaking and writing. | While reading about the men and women who pioneered in space and under the sea, students come across such words as <i>astronaut</i> and <i>nautical</i> and use their knowledge of Greek and Latin roots and the context to work out the meaning of these words. They then compile a list of words they find in their science materials that are based on other common Greek and Latin roots. |

Learning Standard 10

Students will identify, analyze, and apply knowledge of the characteristics of different genres.

| Grade | Standard | Examples |
|------------|---|---|
| 5-8 | Identify and analyze the characteristics of four major genres - non-fiction, fiction, drama, and poetry - as forms chosen by an author to accomplish a purpose. | Students study Anne Frank's <i>Diary of a Young Girl</i> and then study the play based upon it. They select one scene from the play that corresponds to a section in the actual diary and analyze the difference of character portrayal in each. Students analyze the specific lines not found in the diary and present an argument on how the lines present a different view from the diary. Finally, students take excerpts from the diary not used in the play and create an extra scene for the play. (<i>Connects with arts</i>) |

Learning Standard 11

Students will identify, analyze, and apply knowledge of theme in literature and provide evidence from the text to support their understanding.

| Grade | Standard | Examples |
|-------|--|---|
| 5-8 | Apply knowledge of the concept that theme refers to the main idea and meaning of a selection, whether it is implied or stated directly, and analyze and evaluate similar themes across a variety of selections, distinguishing theme from topic. | Students explore the theme that heroism demands unusual courage and risk-taking. They interview adults about their heroes or heroines and read fiction and biographies to identify what both real and imaginary heroes have done. |

COMPOSITION STRAND

Learning Standard 19

Students will write compositions with a clear focus, developing the composition with logically related ideas and adequate supporting detail.

| Grade | Standard | Examples |
|-------|---|---|
| 5-8 | Write coherent compositions with a clear focus and supporting ideas, drawing on strategies that are most helpful for developing and organizing their ideas. | Students studying the American Revolution pretend they are putting out an edition of a Colonial news paper at the time of the Battle of Bunker Hill. They examine reproductions of a Colonial newspaper for the types of essays, articles, cartoons, and illustrations that characterize it. As they work on the project, they develop a list of strategies for generating and organizing the types of article each plans to write. Working in pairs, partners assure that each has constructed an article with a clear focus before they lay out and print their mock newspaper. (<i>Connects with history/social science, arts</i>) |

Learning Standard 20

Students will select and use appropriate genres, modes of reasoning, and speaking styles when writing for different audiences and rhetorical purposes. (See Figure G)

| Grade | Standard | Examples |
|-------|---|--|
| 5-8 | Select and use appropriate genres to achieve different rhetorical purposes. | <p>In preparation for an upcoming student council election, student candidates and their supporters discuss the most appropriate and appealing methods of presenting their messages. They then write speeches, make posters, design campaign buttons, or compose jingles for targeted audiences. As a group, students discuss how genre and audience work together to support the arguments being advanced. <i>(persuasive writing)</i></p> <p>Students are asked to interview a grandparent or senior citizen about his or her experiences during World War II, and then write an analytical essay describing their informant's attitude toward Roosevelt's handling of the war or the news of the invasion of Normandy. <i>(reference/informational writing)</i></p> <p>Students are asked to assume the role of a character from John Gunther's <i>Death Be Not Proud</i> or Doris Lessing's "Through the Tunnel" and write a diary entry or an interior monologue describing who they were and what they felt at a critical moment in the narrative. <i>(expressive writing)</i></p> |

Learning Standard 21

Students will demonstrate improvement in organization, content, paragraph development, level of detail, style, tone, and word choice (diction) in their compositions after revising them.

| Grade | Standard | Examples |
|-------|--|--|
| 5-8 | Revise their writing to improve organization and diction after checking the logic underlying the order of their ideas and the precision of their vocabulary. | So that it can be given to a visiting parent/scientist, sixth grade students revise a report of a science experiment conducted in class. They examine the logic of the order of the steps and the precision of their vocabulary to make sure the visitor can understand exactly what they did, what they concluded, and what steps they followed in their reasoning process. <i>(Connects with science and technology)</i> |

ARIZONA MATHEMATICS STANDARDS (EXCERPTED)

ESSENTIALS (GRADES 4-8, PO = PERFORMANCE OBJECTIVE)

- 3M-E1. Use algebraic methods (write number sentences, in the form of expressions and equations) to explore, model and describe patterns and functions involving numbers, shapes, data, graphs and data plots
 - PO 1. Extend simple geometric and number patterns (e.g., 1, 1, 2, 1, 1, 3, 1, 1, 4 ...) (*Grades 4-5*)
 - PO 2. Create simple geometric and number patterns (*Grades 4-5*)
 - PO 3. Describe a rule for a simple pattern (e.g., 5, 10, 15, 20 ... rule = add five or count by fives) (*Grades 4-5*)
 - PO 4. Generate patterns using algebraic expressions (*Grades 6-8*)

- 3M-E2. Describe, represent and analyze patterns and relationships using shapes, tables, graphs, data plots, verbal rules and standard algebraic notation (This is covered in 3ME1-PO1, PO2, PO3, PO4; and 3ME4-PO1, PO2, PO3, PO4)

- 3M-E3. Describe the concepts of variables, expressions, equations and inequalities
 - PO 1. Describe and use variables in a contextual situation (*Grades 6-8*)
 - PO 2. Evaluate an expression using substitution with four basic operations on whole numbers (*Grades 6-8*)
 - PO 3. Translate a written phrase to an algebraic expression and vice versa (words to symbols and symbols to words) (e.g., the quotient of x and y) (*Grades 6-8*)
 - PO 4. Express a simple inequality from a contextual situation (e.g., Joe earns more than \$5.00 an hour: therefore, $x > 5$.) (*Grades 6-8*)

- 3M-E4. Analyze functional relationships to explain how a change in one variable results in a change in another
 - PO 1. Describe a real-life situation in which a change in one variable results in the change of the other (e.g., temperature in the classroom goes up and the amount of clothing goes down) (*Grades 4-5*)
 - PO 2. Produce the rule (function) that explains the relationship (pattern) between the numbers when a change in the first variable affects the second variable (T-chart, two-row table, or input/output machine) (*Grades 6-8*)
 - PO 3. Compute an "output" for a given "input" in a function (*Grades 4-5*)
 - PO 4. Complete a T-chart for a given rule (*Grades 6-8*)

- 3M-E5. Use patterns and functions to represent and solve problems both formally and informally (e.g., measuring the height a ball bounces by dropping different balls from different starting heights)
 - PO 1. Solve a problem given a pattern both formally and informally (e.g., "In a patterned necklace, how many red and green beads do you need for a 20-inch necklace?") (*Grades 6-8*)

- 3M-E6. Distinguish between linear and nonlinear functions through investigations
 - PO 1. Distinguish between linear and nonlinear functions, given graphic examples (*Grades 6-8*)

- 3M-E7. Solve simple linear equations and inequalities using a variety of methods (e.g., informal, formal, graphical) and a variety of manipulatives
 - PO 1. Solve equations using
 - a. whole numbers with one variable-one step (*Grades 4-5*)
 - b. whole numbers with one variable-multiple steps (*Grades 6-8*)
 - PO 2. Solve linear (first degree) equations using models/manipulatives, symbols and/or graphing in a one-step equation (*Grades 6-8*)
 - PO 3. Graph given data points to represent a linear equation
 - a. on a coordinate grid with whole numbers (*Grades 4-5*)
 - b. in (x, y) form using all four quadrants of a coordinate grid (*Grades 6-8*)

- 3M-E8. Develop, analyze and explain methods for solving proportions
 - PO 1. Describe how to solve a problem in context using a proportion (*Grades 6-8*)
 - PO 2. Compare quantities using ratios (*Grades 6-8*)
 - PO 3. Solve proportions using formal (e.g., cross product) or informal methods (e.g., diagrams, geometric models) (*Grades 6-8*)

NORTH CAROLINA STANDARDS, GRADE 3 MATHEMATICS (EXCERPTED)

| Major Concepts | Computational Skills to Maintain |
|--|--|
| <ul style="list-style-type: none">▪ Multiplication facts/tables▪ Subtraction of multi-digit numbers▪ Length, capacity, and weight▪ Time and temperature▪ Polygons and polyhedra▪ Patterns▪ Read and interpret graphs▪ Permutations and combinations▪ Students will create and solve relevant and authentic problems using appropriate technology and applying these concepts as well as those developed in previous years. | <ul style="list-style-type: none">▪ Count using one-to-one correspondence▪ Addition and subtraction facts▪ Use counting strategies▪ Add multi-digit numbers |

NUMBER SENSE, NUMERATION, AND NUMERICAL OPERATIONS

Competency Goal 1

The learner will model, identify and compute with numbers less than 10,000.

1.01 Read and write word names for numbers to 1,000.

1.02 Relate standard and expanded notation to 3- and 4-digit numbers.

1.03 Compare and order numbers less than 10,000.

1.04 Use estimation techniques in determining solutions to problems.

1.05 Identify odd and even numbers; generalize ways to determine odd or even.

1.06 Model fractions and mixed numbers using regions and sets; describe relationships of parts to whole; record.

1.07 Compare and order fractions using models; describe comparisons.

1.08 Model equivalent fractions using manipulatives and pictures.

1.09 Subtract 2- and 3-digit numbers.

1.10 Model and explain multiplication in a variety of ways including repeated addition, rectangular arrays, and skip counting.

1.11 Model and use the identity and commutative properties for addition and multiplication.

1.12 Model and explain division in a variety of ways including sharing equally, repeated subtraction, rectangular arrays, and its relationship to multiplication.

1.13 Memorize multiplication facts/tables through 10.

1.14 Determine if there is sufficient information to solve a problem; identify missing or extraneous data in problem-solving situations.

1.15 Solve meaningful, multi-step problems involving addition, subtraction and multiplication using a variety of strategies; use calculators as appropriate.

SPATIAL SENSE, MEASUREMENT, AND GEOMETRY

Competency Goal 2

The learner will recognize, understand, and use basic geometric properties, and standard units of metric and customary measurement.

2.01 Draw and classify polygons and polyhedra (solid figures) using appropriate vocabulary: faces, angles, edges, and vertices. Describe the rules for grouping.

2.02 Identify and model symmetry and congruence with concrete materials and drawings.

2.03 Construct with cubes a solid to match a given picture or model.

2.04 Recognize a three-dimensional object from different perspectives.

2.05 Observe and describe geometry in the environment.

- 2.06** Estimate and measure length (inches, feet, yards, centimeters, meters), weight (grams, ounces, pounds), and capacity (cups, pints, quarts, gallons, liters) using appropriate tools and units.
- 2.07** Model and compare units within the same measurement system.
- 2.08** Model the concepts of area and perimeter using concrete materials, non-standard, and standard units. Estimate, record, and explain results.
- 2.09** Determine the value of sets of coins to \$5.00 and create equivalent amounts with different coins.
- 2.10** Estimate and compute the cost of items up to \$5.00; make change up to \$5.00.
- 2.11** Tell time to the nearest minute with digital and analog clocks; record. Solve problems related to time.
- 2.12** Read Celsius and Fahrenheit thermometers; relate temperatures to everyday situations.
- 2.13** Solve problems using measurement concepts and procedures. Explain the solutions.

DELAWARE SCIENCE STANDARDS (GRADES 3 AND 5, EXCERPTED)

STANDARD TWO: MATERIALS AND THEIR PROPERTIES

Materials exist throughout our physical world. Students will develop a basic understanding of the structure and properties of materials. They will also experience and learn the processes by which materials are changed and how the uses of materials are related to their properties.

By the completion of Grade 3, students will know that:

Properties and Structure of Materials

1. Objects can be classified according to physical properties such as size, shape, weight, texture, color, and material composition such as wood, metal, plastic, or cloth. These properties can be observed and measured using tools such as rulers, balances, magnifiers, and thermometers.

Example: Perform measurements and develop descriptions of the physical properties of common objects. Construct classification systems which sort and group these objects based on their physical properties.

2. Materials exist in one of three states - solid, liquid, or gas - and can be changed from one state of matter to another. Each state has distinct physical properties. Physical properties and changes from one state of matter to another state are strongly influenced by heating and cooling.

Example: Explore and describe the change in properties of a material as the material changes from one state to another.

3. Objects and materials may be composed of structures too small to be seen without the use of a tool such as a magnifier.

Example: Use a magnifier to inspect a variety of common objects and materials. Describe features of the object or material that are only visible with the use of the magnifier. Discuss and compare the observations with classmates.

Changes in Materials

1. Physical properties of materials can be changed by exposure to heat, light, pressure, and chemicals or by cutting, mixing, and grinding. Not all materials respond the same way to these treatments.

Example: Subject a variety of materials to different treatments (e.g., newspaper to light, section of apple to air, candy bar to heat). Describe the physical property changes that occur.

Mixtures

1. Physical mixtures such as trail mix, tossed salad, and iron fillings/sand, are composed of different kinds of materials, each having distinct physical properties. Physical property differences can often be used to separate, sort, and group the materials of a mixture.

Example: Prepare a variety of physical mixtures. Observe and discuss how the properties of these mixtures are different from the properties of the individual components. Identify those mixtures which can be separated back into their component parts and speculate on how this would be accomplished.

Material Technology

1. The properties of a material or an object influence how the material or object is used. Some materials are more suitable than others for making a particular product or device.

Example: Investigate the properties of materials that make them useful for a given purpose. Use this knowledge to design a common object or to solve a problem (e.g., device to shade one's eyes from the sun, water repellent rain wear).

2. Technology has created and introduced new materials to help people solve problems. In some cases a new material may solve one problem, but create another one.

Example: Investigate specific examples of how a material innovation (e.g., plastic bottles, styrofoam cups) solved one problem but at the same time created a new problem.

By the completion of Grade 5, students will know that:

Properties and Structure of Materials

1. Observable and measurable properties of materials such as solubility, transparency, magnetic characteristics, strength, and the ability to conduct heat and electricity can be used to identify, group, and classify materials.

Example: Select a variety of common household materials such as sugar, salt, baking powder, talcum powder, flour, and starch, and design simple tests to determine their solubility in common solvents (e.g., water, alcohol, oil).

2. The ability to define structure in detail is limited when objects or materials are studied with the naked eye. The observation and determination of more detailed structure require magnification.

Example: Without magnification, inspect and describe the physical characteristics of some commonly found substances such as salt or talcum powder. Continue the inspection using magnification to expand the physical description of these materials.

Changes in Materials

1. The weight of an object remains unchanged when broken into parts, and the parts together weigh the same as the original object.

Example: Construct objects out of smaller parts, take them apart, and rearrange them. Demonstrate that the weight of the whole object is equal to the sum of the weight of the parts.

Prepare simple aqueous solutions from salt or sugar. Demonstrate that the final weight of the solution is equal to the sum of the weights of the ingredients and that the dissolved materials can be fully recovered by careful and total evaporation of the water.

2. The properties of materials and objects can be changed by interaction with air, moisture, light, heat, and other substances or materials. The structure of materials and objects strongly influences behavior during such interactions.

Example: Conduct investigations which demonstrate and measure the changes in properties that occur when common materials interact with their environment (e.g., dissolving, weathering, shrinking, melting, rusting).

Mixtures and Solutions

1. Most things we deal with everyday are mixtures of component substances. The properties of these mixtures largely depend on the relative amounts and properties of the components. Mixtures can consist of different solid materials or be solutions such as salt or sugar in water.

Example: Prepare aqueous solutions with different component concentrations using a variety of materials such as Kool Aid, grape juice, sugar and salt. Observe and record changes in properties of these mixtures (e.g., color, taste, transparency, feel) as the relative amount of the component substance changes.

Material Technology

1. Through science and technology, new materials are created whose function and performance have advantages over natural materials and lead to benefits for society.

Example: Investigate examples of new material inventions and how and why these materials displace or enhance the performance of natural materials. Some examples include: glass vs. plastic bottles, steel vs. fiber glass fishing rods, coated vs. uncoated cooking ware, 100% cotton vs. synthetic blends.

2. The creation of new synthetic materials has challenged individuals and industry to consider both the benefits and the risks in the use of these materials. One current example is the effort to find better ways to discard and recycle different materials.

Example: Monitor the amount of waste generated in various activities at school and design a program for effective recycling of one of the major components of the trash.

CALIFORNIA CONTENT STANDARDS FOR HISTORY-SOCIAL SCIENCE (EXCERPTED)

PRINCIPLES OF AMERICAN DEMOCRACY AND ECONOMICS

Students in grade 12 pursue a deeper understanding of the institutions of American government. They compare systems of government in the world today and analyze the history and changing interpretations of the Constitution, the Bill of Rights, and the current state of the legislative, executive, and judiciary branches of government. An emphasis is placed on analyzing the relationship among federal, state, and local governments, with particular attention paid to important historical documents such as the *Federalist Papers*. These standards represent the culmination of civic literacy as students prepare to vote, participate in community activities, and assume the responsibilities of citizenship.

In addition to studying government in grade 12, students will also master fundamental economic concepts, applying the tools (graphs, statistics, equations) from other subject areas to the understanding of operations and institutions of economic systems. Studied in a historic context are the basic economic principles of micro- and macroeconomics, international economics, comparative economic systems, measurement, and methods.

Principles of American Democracy

12.1 Students explain the fundamental principles and moral values of American democracy as expressed in the U.S. Constitution and other essential documents of American democracy.

1. Analyze the influence of ancient Greek, Roman, English, and leading European political thinkers such as John Locke, Charles-Louis Montesquieu, Niccolò Machiavelli, and William Blackstone on the development of American government.
2. Discuss the character of American democracy and its promise and perils as articulated by Alexis de Tocqueville.
3. Explain how the U.S. Constitution reflects a balance between the classical republican concern with promotion of the public good and the classical liberal concern with protecting individual rights; and discuss how the basic premises of liberal constitutionalism and democracy are joined in the Declaration of Independence as “self-evident truths.”
4. Explain how the Founding Fathers’ realistic view of human nature led directly to the establishment of a constitutional system that limited the power of the governors and the governed as articulated in the *Federalist Papers*.
5. Describe the systems of separated and shared powers, the role of organized interests (*Federalist Paper Number 10*), checks and balances (*Federalist Paper Number 51*), the importance of an independent judiciary (*Federalist Paper Number 78*), enumerated powers, rule of law, federalism, and civilian control of the military.
6. Understand that the Bill of Rights limits the powers of the federal government and state governments.

12.2 Students evaluate and take and defend positions on the scope and limits of rights and obligations as democratic citizens, the relationships among them, and how they are secured.

1. Discuss the meaning and importance of each of the rights guaranteed under the Bill of Rights and how each is secured (e.g., freedom of religion, speech, press, assembly, petition, privacy).
2. Explain how economic rights are secured and their importance to the individual and to society (e.g., the right to acquire, use, transfer, and dispose of property; right to choose one's work; right to join or not join labor unions; copyright and patent).
3. Discuss the individual's legal obligations to obey the law, serve as a juror, and pay taxes.
4. Understand the obligations of civic-mindedness, including voting, being informed on civic issues, volunteering and performing public service, and serving in the military or alternative service.
5. Describe the reciprocity between rights and obligations; that is, why enjoyment of one's rights entails respect for the rights of others.
6. Explain how one becomes a citizen of the United States, including the process of naturalization (e.g., literacy, language, and other requirements).

12.3 Students evaluate and take and defend positions on what the fundamental values and principles of civil society are (i.e., the autonomous sphere of voluntary personal, social, and economic relations that are not part of government), their interdependence, and the meaning and importance of those values and principles for a free society.

1. Explain how civil society provides opportunities for individuals to associate for social, cultural, religious, economic, and political purposes.
2. Explain how civil society makes it possible for people, individually or in association with others, to bring their influence to bear on government in ways other than voting and elections.
3. Discuss the historical role of religion and religious diversity.
4. Compare the relationship of government and civil society in constitutional democracies to the relationship of government and civil society in authoritarian and totalitarian regimes.

12.4 Students analyze the unique roles and responsibilities of the three branches of government as established by the U.S. Constitution.

1. Discuss Article I of the Constitution as it relates to the legislative branch, including eligibility for office and lengths of terms of representatives and senators; election to office; the roles of the House and Senate in impeachment proceedings; the role of the vice president; the enumerated legislative powers; and the process by which a bill becomes a law.
2. Explain the process through which the Constitution can be amended.
3. Identify their current representatives in the legislative branch of the national government.
4. Discuss Article II of the Constitution as it relates to the executive branch, including eligibility for office and length of term, election to and removal from office, the oath of office, and the enumerated executive powers.

5. Discuss Article III of the Constitution as it relates to judicial power, including the length of terms of judges and the jurisdiction of the Supreme Court.
6. Explain the processes of selection and confirmation of Supreme Court justices.

12.5 Students summarize landmark U.S. Supreme Court interpretations of the Constitution and its amendments.

1. Understand the changing interpretations of the Bill of Rights over time, including interpretations of the basic freedoms (religion, speech, press, petition, and assembly) articulated in the First Amendment and the due process and equal-protection-of-the-law clauses of the Fourteenth Amendment.
2. Analyze judicial activism and judicial restraint and the effects of each policy over the decades (e.g., the Warren and Rehnquist courts).
3. Evaluate the effects of the Court's interpretations of the Constitution in *Marbury v. Madison*, *McCulloch v. Maryland*, and *United States v. Nixon*, with emphasis on the arguments espoused by each side in these cases.
4. Explain the controversies that have resulted over changing interpretations of civil rights, including those in *Plessy v. Ferguson*, *Brown v. Board of Education*, *Miranda v. Arizona*, *Regents of the University of California v. Bakke*, *Adarand Constructors, Inc. v. Peña*, and *United States v. Virginia* (VMI).

12.6 Students evaluate issues regarding campaigns for national, state, and local elective offices.

1. Analyze the origin, development, and role of political parties, noting those occasional periods in which there was only one major party or were more than two major parties.
2. Discuss the history of the nomination process for presidential candidates and the increasing importance of primaries in general elections.
3. Evaluate the roles of polls, campaign advertising, and the controversies over campaign funding.
4. Describe the means that citizens use to participate in the political process (e.g., voting, campaigning, lobbying, filing a legal challenge, demonstrating, petitioning, picketing, running for political office).
5. Discuss the features of direct democracy in numerous states (e.g., the process of referendums, recall elections).
6. Analyze trends in voter turnout; the causes and effects of reapportionment and redistricting, with special attention to spatial districting and the rights of minorities; and the function of the Electoral College.

12.7 Students analyze and compare the powers and procedures of the national, state, tribal, and local governments.

1. Explain how conflicts between levels of government and branches of government are resolved.
2. Identify the major responsibilities and sources of revenue for state and local governments.

3. Discuss reserved powers and concurrent powers of state governments.
4. Discuss the Ninth and Tenth Amendments and interpretations of the extent of the federal government's power.
5. Explain how public policy is formed, including the setting of the public agenda and implementation of it through regulations and executive orders.
6. Compare the processes of lawmaking at each of the three levels of government, including the role of lobbying and the media.
7. Identify the organization and jurisdiction of federal, state, and local (e.g., California) courts and the interrelationships among them.
8. Understand the scope of presidential power and decision making through examination of case studies such as the Cuban Missile Crisis, passage of Great Society legislation, War Powers Act, Gulf War, and Bosnia.

12.8 Students evaluate and take and defend positions on the influence of the media on American political life.

1. Discuss the meaning and importance of a free and responsible press.
2. Describe the roles of broadcast, print, and electronic media, including the Internet, as means of communication in American politics.
3. Explain how public officials use the media to communicate with the citizenry and to shape public opinion.

12.9 Students analyze the origins, characteristics, and development of different political systems across time, with emphasis on the quest for political democracy, its advances, and its obstacles.

1. Explain how the different philosophies and structures of feudalism, mercantilism, socialism, fascism, communism, monarchies, parliamentary systems, and constitutional liberal democracies influence economic policies, social welfare policies, and human rights practices.
2. Compare the various ways in which power is distributed, shared, and limited in systems of shared powers and in parliamentary systems, including the influence and role of parliamentary leaders (e.g., William Gladstone, Margaret Thatcher).
3. Discuss the advantages and disadvantages of federal, confederal, and unitary systems of government.
4. Describe for at least two countries the consequences of conditions that gave rise to tyrannies during certain periods (e.g., Italy, Japan, Haiti, Nigeria, Cambodia).
5. Identify the forms of illegitimate power that twentieth-century African, Asian, and Latin American dictators used to gain and hold office and the conditions and interests that supported them.
6. Identify the ideologies, causes, stages, and outcomes of major Mexican, Central American, and South American revolutions in the nineteenth and twentieth centuries.

7. Describe the ideologies that give rise to Communism, methods of maintaining control, and the movements to overthrow such governments in Czechoslovakia, Hungary, and Poland, including the roles of individuals (e.g., Alexander Solzhenitsyn, Pope John Paul II, Lech Walesa, Vaclav Havel).
8. Identify the successes of relatively new democracies in Africa, Asia, and Latin America and the ideas, leaders, and general societal conditions that have launched and sustained, or failed to sustain, them.

12.10 Students formulate questions about and defend their analyses of tensions within our constitutional democracy and the importance of maintaining a balance between the following concepts: majority rule and individual rights; liberty and equality; state and national authority in a federal system; civil disobedience and the rule of law; freedom of the press and the right to a fair trial; the relationship of religion and government.

Principles of Economics

12.1 Students understand common economic terms and concepts and economic reasoning.

1. Examine the causal relationship between scarcity and the need for choices.
2. Explain opportunity cost and marginal benefit and marginal cost.
3. Identify the difference between monetary and nonmonetary incentives and how changes in incentives cause changes in behavior.
4. Evaluate the role of private property as an incentive in conserving and improving scarce resources, including renewable and nonrenewable natural resources.
5. Analyze the role of a market economy in establishing and preserving political and personal liberty (e.g., through the works of Adam Smith).

12.2 Students analyze the elements of America’s market economy in a global setting.

1. Understand the relationship of the concept of incentives to the law of supply and the relationship of the concept of incentives and substitutes to the law of demand.
2. Discuss the effects of changes in supply and/or demand on the relative scarcity, price, and quantity of particular products.
3. Explain the roles of property rights, competition, and profit in a market economy.
4. Explain how prices reflect the relative scarcity of goods and services and perform the allocative function in a market economy.
5. Understand the process by which competition among buyers and sellers determines a market price.
6. Describe the effect of price controls on buyers and sellers.
7. Analyze how domestic and international competition in a market economy affects goods and services produced and the quality, quantity, and price of those products.
8. Explain the role of profit as the incentive to entrepreneurs in a market economy.

9. Describe the functions of the financial markets.
10. Discuss the economic principles that guide the location of agricultural production and industry and the spatial distribution of transportation and retail facilities.

12.3 Students analyze the influence of the federal government on the American economy.

1. Understand how the role of government in a market economy often includes providing for national defense, addressing environmental concerns, defining and enforcing property rights, attempting to make markets more competitive, and protecting consumers' rights.
2. Identify the factors that may cause the costs of government actions to outweigh the benefits.
3. Describe the aims of government fiscal policies (taxation, borrowing, spending) and their influence on production, employment, and price levels.
4. Understand the aims and tools of monetary policy and their influence on economic activity (e.g., the Federal Reserve).

12.4 Students analyze the elements of the U.S. labor market in a global setting.

1. Understand the operations of the labor market, including the circumstances surrounding the establishment of principal American labor unions, procedures that unions use to gain benefits for their members, the effects of unionization, the minimum wage, and unemployment insurance.
2. Describe the current economy and labor market, including the types of goods and services produced, the types of skills workers need, the effects of rapid technological change, and the impact of international competition.
3. Discuss wage differences among jobs and professions, using the laws of demand and supply and the concept of productivity.
4. Explain the effects of international mobility of capital and labor on the U.S. economy.

12.5 Students analyze the aggregate economic behavior of the U.S. economy.

1. Distinguish between nominal and real data.
2. Define, calculate, and explain the significance of an unemployment rate, the number of new jobs created monthly, an inflation or deflation rate, and a rate of economic growth.
3. Distinguish between short-term and long-term interest rates and explain their relative significance.

12.6 Students analyze issues of international trade and explain how the U.S. economy affects, and is affected by, economic forces beyond the United States's borders.

1. Identify the gains in consumption and production efficiency from trade, with emphasis on the main products and changing geographic patterns of twentieth-century trade among countries in the Western Hemisphere.

2. Compare the reasons for and the effects of trade restrictions during the Great Depression compared with present-day arguments among labor, business, and political leaders over the effects of free trade on the economic and social interests of various groups of Americans.
3. Understand the changing role of international political borders and territorial sovereignty in a global economy.
4. Explain foreign exchange, the manner in which exchange rates are determined, and the effects of the dollar's gaining (or losing) value relative to other currencies.

NEVADA CONTENT STANDARDS FOR HISTORY (EXCERPTED)

| Grade 2 | Grade 3 | Grade 5 | Grade 8 | Grade 12 |
|---|---|---|--|--|
| Students know and are able to do everything required in earlier grades and: | Students know and are able to do everything required in earlier grades and: | Students know and are able to do everything required in earlier grades and: | Students know and are able to do everything required in earlier grades and: | Students know and are able to do everything required in earlier grades and: |
| | 7.3.9 Identify the Statue of Liberty as a patriotic symbol. | 7.5.7 <i>Identify the contributions of the inventors and discoverers, including:</i> <ul style="list-style-type: none"> • Thomas Edison • Wright brothers • Alexander Graham Bell • George Washington Carver C.4.5.1; E.3.5.3 | 7.8.7 Describe effects of industrialization and new technologies on the transformation of the United States, including: <ul style="list-style-type: none"> • steel industry • mass production • mechanized assembly line • communication G.5.8.2; G.5.8.3; G.5.8.4 | 7.12.7 Describe the effect of industrial technology innovations and urbanization on United States social and economic development. E.6.12.3; E.6.12.6; E.7.12.1 |
| | | | 7.8.8 <i>Identify American industrialists and their contributions, including:</i> <ul style="list-style-type: none"> • Andrew Carnegie • Henry Ford • John D. Rockefeller E.7.8.4 | 7.12.8 <i>Describe the development of corporate capitalism, including:</i> <ul style="list-style-type: none"> • J.P. Morgan • mass production • vertical and horizontal integration/consolidation E.1.12.2; E.4.12.2; E.4.12.3; E.6.12.2; E.7.12.2 |
| | 7.3.9 Identify the Statue of Liberty as a patriotic symbol. | 7.5.9 <i>Describe the contributions of immigrant groups to the United States.</i> G.4.5.3 | 7.8.9 <i>Identify immigrant and native groups involved in mining, ranching, railroads, and commerce in Nevada and the United States.</i> | 7.12.9 <i>Explain the motivations for groups coming to the United States and describe their contributions to United States society.</i> |

corporate capitalism: an economic system in which corporations (companies owned by stockholders) own all or most of the means of production, distribution, and exchange and operate them for profit

horizontal integration/consolidation: the monopolized control of one aspect of production

industrialization: the establishment of an economic and social system characterized by large industries, machine production, and the concentration of workers in urban areas

mechanized assembly line: an assembly line in which a worker performs a specialized task in assembling a product as it is passed along a mechanical conveyor system, usually consisting of belts or rollers

urbanization: the demographic process in which cities develop and grow

vertical integration/consolidation: control of all phases of a product's development, from raw materials to the finished product

NEVADA PERFORMANCE STANDARDS FOR HISTORY (EXCERPTED, CONTINUED)

Social Studies Performance Level Descriptors

**History
Grade 3**

| | |
|-----------------------------|---|
| Content Standard 7.0 | 1860-1920: Students understand the importance and impact of political, economic, and social ideas. |
| EXCEEDS STANDARD | <ul style="list-style-type: none"> ▪ Tell why the Statue of Liberty is a patriotic symbol. |
| MEETS STANDARD | <ul style="list-style-type: none"> ▪ Identify the Statue of Liberty as a patriotic symbol. |
| APPROACHES STANDARD | <ul style="list-style-type: none"> ▪ Know that the Statue of Liberty is a patriotic symbol, but are confused about its significance. |
| BELOW STANDARD | <ul style="list-style-type: none"> ▪ Unable to identify the Statue of Liberty. |

Social Studies Performance Level Descriptors

**History
Grade 5**

| | |
|-----------------------------|--|
| Content Standard 7.0 | 1860-1920: Students understand the importance and impact of political, economic, and social ideas. |
| EXCEEDS STANDARD | <ul style="list-style-type: none"> ▪ Provide details about inventors’ and discoverers’ lives, including Thomas Edison, the Wright brothers, Alexander Graham Bell, and George Washington Carver, and why their contributions are important. ▪ Explain why specific immigrant groups settled in Nevada. |
| MEETS STANDARD | <ul style="list-style-type: none"> ▪ Identify the contributions of inventors and discoverers, including Thomas Edison, the Wright brothers, Alexander Graham Bell, and George Washington Carver. ▪ Describe the contributions of immigrant groups to Nevada. |
| APPROACHES STANDARD | <ul style="list-style-type: none"> ▪ Confuse inventors and discoverers with their contributions. ▪ Define immigration, with limited knowledge of the contributions made by Nevada immigrants. |
| BELOW STANDARD | <ul style="list-style-type: none"> ▪ Unable to provide examples of discoverers and their contributions. ▪ Unable to define immigration. |

Social Studies Performance Level Descriptors

History
Grade 8

| Content Standard 7.0 1860-1920:- <i>Students understand the importance and impact of political, economic, and social ideas.</i> | |
|--|--|
| EXCEEDS STANDARD | <ul style="list-style-type: none"> ▪ Provide detailed descriptions of new technologies, including the steel industry, mass production, the mechanized assembly line, and communication tools, that contributed to the industrialization of the United States and their impact on the United States. ▪ Describe the impact of industrialists on the industrialization of the United States, including Andrew Carnegie, Henry Ford, and John D. Rockefeller,. ▪ Describe the significance of immigrant and native groups to the development of Nevada and the United States |
| MEETS STANDARD | <ul style="list-style-type: none"> ▪ Describe effects of industrialization and new technologies on the transformation of the United States, including the steel industry, mass production, the mechanized assembly line, and communication tools. ▪ Identify American industrialists and their contributions, including Andrew Carnegie, Henry Ford, and John D. Rockefeller. ▪ Identify immigrant and native groups involved in mining, ranching, railroads, and commerce in Nevada and the United States. |
| APPROACHES STANDARD | <ul style="list-style-type: none"> ▪ Define industrialization and identify some of the new technologies, but are unable to identify the effects on the United States. ▪ Confuse United States industrialists and their contributions. ▪ Confuse the immigrant and native groups involved in mining, ranching, railroads, and commerce in Nevada and the United States. |
| BELOW STANDARD | <ul style="list-style-type: none"> ▪ Unable to identify the effects of industrialization and/or new technologies. ▪ Identify an United States industrialist. ▪ Unable to identify immigrant or native groups that contributed to mining, ranching, railroads, and commerce in Nevada or the United States. |

Social Studies Performance Level Descriptors

History
Grade 12

| Content Standard 7.0 1860-1920: <i>Students understand the importance and impact of political, economic, and social ideas.</i> | |
|---|--|
| EXCEEDS STANDARD | <ul style="list-style-type: none"> ▪ Describe how industrial technology, innovations, and urbanization impacted the social and economic development of the United States, citing specific and detailed examples. ▪ Describe the relationship between the development of corporate capitalism and J.P. Morgan, mass production, and vertical and horizontal integration/consolidation. ▪ Describe, in detail, the reasons for waves of immigrants emigrating from other countries and give several specific examples of their subsequent impact on United States society. ▪ Describe nativism and how it impacted United States attitudes and political policies toward immigrants. ▪ Compare, contrast, and define the origins, issues, and people involved in the development of the labor movement. |
| MEETS STANDARD | <ul style="list-style-type: none"> ▪ Describe the effect of industrial technology innovations and urbanization on United States social and economic development. ▪ Describe the development of corporate capitalism, including J.P. Morgan, mass production, and vertical and horizontal integration/consolidation. ▪ Explain the motivations for groups coming to the United States and describe their contributions to United States society. ▪ Describe nativism and explain the response to immigration into the United States. |
| APPROACHES STANDARD | <ul style="list-style-type: none"> ▪ Identify a few industrial technology innovations, but have difficulty connecting them with United States social and economic development. ▪ Identify J.P. Morgan and mass production, but inaccurately describes corporate capitalism. ▪ Identify that various peoples came to the United States, but unable to tell the causes or results of immigration. |
| BELOW STANDARD | <ul style="list-style-type: none"> ▪ Confuses industrial technology innovations. ▪ Unable to identify mass production, J.P. Morgan, and/or corporate capitalism. ▪ Identify that immigrants came to the United States |

APPENDIX B:
SUMMARY REVIEWS

SUMMARY REVIEW

ENGLISH LANGUAGE ARTS

SUMMARY

In general, the standards for English language arts are weak, primarily because important skills and concepts are neglected and the standards often show little increase in rigor and sophistication from grade level to grade level. The state should consider revising/editing the existing standards with an eye to the choice of verbs used and for increasing levels of sophistication. The state should also consider adding some important skills and concepts to the standards, either by creating new standards or adding on to existing ones. Some reorganization of the standards within the pertinent learning areas might facilitate this improvement, such as creating one learning area for all of English language arts instead of distributing the subjects among three, and reorganizing the standards to de-emphasize the difference between academic and technical learning material, since both are important.

INTRODUCTION

The subject area of English language arts is found in three learning areas: Read, Listen and View; Write and Speak; and Arts and Literature. Read, Listen and View describes how students should demonstrate comprehension of the meaning of various materials and how they should be able to interpret that meaning. At the primary and intermediate levels, the types of materials to be read are not specified; but at the middle level, there are different sections for fiction, nonfiction, and technical reading. At the high school level, students can choose between Reading, Listening and Viewing Complex Information or Technical Reading, Listening and Viewing.

Write and Speak includes many different ways students express themselves, including different kinds of writing and different kinds of speaking. At the primary and intermediate levels, students focus on writing and speaking. At the middle level, they also demonstrate competency in interpersonal communication, which includes skills for communicating in a group and conflict resolution. At the high school level, students choose Academic Writing or Technical Writing, and Public Speaking or Interpersonal Communication (which, like its middle level counterpart, includes working in a group and conflict resolution). Arts and Literature combines literary analysis with arts interpretation and performance. The literature element is found only at the high school level; the arts dominate the other three levels. At the high school level, students must “demonstrate the ability to both interpret and evaluate complex works of literature.”

Parts of this analysis apply to the subject of English language arts as a whole and are true across all three learning areas. Following this analysis is a summary of the answers given by reviewers to the specific questions about English language arts. Summary reviews of the three learning areas follow. These reviews will omit comments that were true across all three areas and focus on the individual strengths and weakness of each learning area.

ENGLISH LANGUAGE ARTS ACROSS THE THREE LEARNING AREAS

Important Subject Matter

While all important topics are addressed, these standards are too vague, and some important content is omitted. The meaning of various standards is unclear and expectations are not clearly defined, leaving no assurance of rigor or variety. The learning areas for English language arts are missing or underemphasizing extremely important processes and concepts, such as the writing process, reading strategies and reading requirements, and tend to emphasize process over content. Research is also undervalued; despite its strong presence in the Inquiry standards, it is not emphasized enough in English language arts, particularly the writing of research papers and findings.

Rigor and Progression

Overall, the reviewers agreed that there is not enough rigor; for example, words such as *identify* are used instead of *analyze*, *synthesize* or *evaluate*. Too frequently, language from lower levels is strikingly similar to language at upper levels, implying little increase in skill and complexity. Progression from grade level to grade level should indicate an increasing complexity of work, such as moving from reading isolated texts to drawing conclusions across more than one text, or showing increasingly sophisticated reading comprehension. A Minnesota intermediate level Read, Listen and View standard expects students to “distinguish fact from opinion in nonfiction selections” and by high school to “distinguish fact from opinion, fiction from nonfiction, or both.” While it is valid for students to make these distinctions, they should by high school be able to make much more refined analyses of texts, such as comparing different opinions across texts addressing similar topics, analyzing an author’s use of fact or opinion to convey a point, or evaluating how an author uses elements of fiction or nonfiction to achieve a purpose. As it stands, Minnesota’s requirement here only demands — in the case of this standard — lower level thinking skills.

In general, the reviewers agreed that students could be asked to do more. Expectations for student performance tend to fall fairly low on Bloom’s taxonomy; students are infrequently asked to evaluate or analyze, for example.

Specificity

Reviewers agreed that the standards within the three learning areas, particularly Read, Listen and View and Write and Speak, is not specific enough. Important skills and concepts are summarily addressed with overly broad language that fails to make clear what is expected of all students in Minnesota. Examples are provided in the summary review for each learning area.

Clarity

The review team questioned the division of the topics into the three learning areas – why was it done? is it really useful? The division seemed to be arbitrary and unnecessary. In fact, it is possible that dividing up the topics of English language arts adds an additional layer of confusion

for teachers and curriculum developers. This structure also makes the areas appear to represent isolated rather than integrated elements, which actually downplays the goal of interdisciplinary learning. Particularly, the inclusion of literature analysis in Literature and the Arts caused confusion, since nonfiction analysis is in Read, Listen and View. An introduction explaining the goals and assumptions of the document would have been useful and is a tool employed in many state standards.

In terms of the organization of the document, most reviewers felt that the document they reviewed is not presented as well as it could be; and some recommended engaging a professional designer to improve it. In particular, the order of the document from high school to primary to intermediate to middle is confusing, and reflects an inconsistent numbering system and use of verb tenses.

RESPONSES TO THE ADDITIONAL QUESTIONS FOR ENGLISH LANGUAGE ARTS

Reviewers were asked to respond to four additional questions specific to important issues in English language arts that deserve special attention.

1a. Do the specifications of the standards require a student to engage in learning opportunities that develop strategies for comprehension of literary and informational text?

While comprehension was mentioned, strategies for comprehension were not specifically discussed. Particularly lacking is early reading. Comprehension is only discussed in the most general matter; the only descriptor for literal comprehension is the term “age appropriate,” which is inadequate for a standard. Compare a few standards from Minnesota’s primary literal comprehension standards with some from the New Standards elementary performance standards:

Minnesota, Primary Level:

A student shall demonstrate comprehension of literal meaning through reading, viewing, and listening to nonfiction and fiction selections by:

- 1) identifying main ideas and some supporting details;

New Standards, Elementary Level:

The student reads and comprehends at least four books ... about one issue or subject, or four books by a single writer, or four books in one genre, and produces evidence of reading that:

- makes and supports warranted and

- 2) retelling main events or ideas in sequence;
- 3) pronouncing new words using phonic skills;
- 4) reading aloud fluently with appropriate expression ...

- responsible assertions about text;
- supports assertions with elaborated and convincing evidence ...
- The student reads aloud, accurately ... in a way that makes meaning clear to listeners by:
 - using a range of cueing systems, e.g., phonics and context clues, to determine pronunciation and meanings
 - reading with a rhythm, flow, and meter that sounds like everyday speech

Note that the New Standards set out clear expectations for what students should be reading (four books by a single writer, for example) and paint a picture of what good comprehension looks like (elaborated and convincing evidence). Minnesota’s standards are not as clear. A standard that says a student should “read with a rhythm, flow, and meter that sounds like everyday speech” is more clear and specific than one that says that students should “read aloud fluently with appropriate expression.” Note also the increased rigor found in the New Standards. While an elementary student in Minnesota need only identify main ideas and some supporting details, a student who meets the New Standards can make and support warranted and responsible assertions and then support those assertions with evidence. Such support allows for much deeper understanding of reading material.

1b. Are the specifications of the standards appropriate to the quality and quantity of the reading materials that students should be reading at the various grade levels illustrated?

The standards are silent on this topic. Nothing is mentioned about genres, types of children’s literature or quantity. Again, the only descriptor for these issues is “age appropriate.” Many states address this issue by giving recommendations of reading lists and/or examples with the standards that include text names to give a flavor of the level of reading expected of students at particular grade levels.

2. Do the specifications of the standards clearly describe the quality and complexity of student writing required?

The standards are silent on this issue as well. References to the quality and complexity of student writing are general. For example, at the high school level, in academic writing, students must use standard written English “for a variety of academic purposes and situations” to write compositions that “analyze patterns and relationships of ideas, topics, or themes” and “construct support for a position, argument, plan, or idea.” By contrast, examine the following grade 9–10 writing standard from California:

Students will write coherent and focused texts that convey a well-defined perspective and tightly reasoned argument. Student writing demonstrates awareness of audience and purpose and use of the stages of the writing process, as needed.

- 1.1 establish a controlling impression or coherent thesis that conveys a clear and distinctive perspective on the subject and maintains a consistent tone and focus throughout the piece of writing
- 1.2 use precise language, action verbs, sensory details, appropriate modifiers, and active rather than passive voice ...

This example is much more specific about the quality of the writing that is expected from students and would prove to be much more useful to teachers. While the Minnesota standards say students should describe, narrate, analyze, construct and evaluate in their writing, and that students will use grammar, language mechanics and other conventions of standard written English, there is no indication of how students are to acquire these skills and in what kind of logical progression. There should be some examples of forms of narrative and expository writing that students should have control over, and where common forms are used at more than one level, such as the persuasive essay, it should be clear how the student's use of these forms becomes more complex as he/she becomes a more adept writer.

3. Is there a thorough treatment of vocabulary and conventions?

As with reading and writing, vocabulary is mentioned in only the most general ways. The most specific reference to vocabulary has students “demonstrate appropriate techniques for learning new vocabulary” (primary level, Read, Listen View) and reviewers agreed that the expectation was inadequate and too general. At other levels students must “demonstrate techniques for improving and expanding vocabulary” (intermediate); “show evidence of an ongoing process for expanding vocabulary” (middle); and know “relevant technical vocabulary” (middle). Compare this standard to a standard that has students:

use their knowledge of word origins and word relationships, as well as historical and literary context clues, both to determine the meaning of specialized vocabulary and to understand the precise meaning of grade-level appropriate words ... use word meanings within the appropriate context and be able to verify those meanings by definition, restatement, example, comparison, or contrast. (*Standards for Excellence in Education, based on the standards of California, grade 8*).

This is a much clearer way of describing vocabulary acquisition much clearer than “showing evidence of an ongoing process.”

English language conventions are also only dealt with in the most vague of terms. There is mention that students need to be able to edit for spelling and mechanics by grade 12. This topic is dealt with in more detail in the review of Read, Listen and View and Write and Speak.

4. Do the standards include the essential concepts and skills at the level of sophistication contained in the best standards in the nation?

Most of the standards for English language arts need to be more sophisticated. The few expectations that are clear enough are not sufficiently rigorous. While the standards refer to many of the essential concepts and skills, the level of sophistication is far below that found in high-quality state standards. Furthermore, that sophistication is masked by vague language. For example, it is difficult to find the sophistication in the standard for reading, listening and viewing complex information at the high school level:

A student shall demonstrate the ability to comprehend and evaluate complex information in varied nonfiction by reading, listening, and viewing varied English language selections containing complex information, and, in these selections:

- a) identify main ideas and supporting information;
- b) distinguish fact from opinion, fiction from nonfiction, or both;
- c) identify bias, point of view, and author's intent;
- d) identify relevant background information; and
- e) analyze and evaluate the credibility of evidence and source, the logic of reasoning, and how the type of communication shapes or limits information.

First, the stem statement repeats similar information multiple times, confusing the reader. Furthermore, what is meant by “complex information” is unclear. What kind of English language selections are intended? Finally, having students identify only main ideas and distinguish fact from opinion is well below the level of sophistication found in other high school English standards.

SUMMARY REVIEW
ENGLISH LANGUAGE ARTS
LEARNING AREA: READ, LISTEN AND VIEW

INTRODUCTION

Read, Listen and View is the weakest of the three learning areas dealing with English language arts. There is some strength in the performances students are asked to achieve, and in the practical ways students are asked to demonstrate their ability to read, listen and view material. However, this learning area sets few real expectations for students — particularly in what they are to know — and neglects important details of vital reading strategies and processes. The statements contained within it leave many key ideas undefined and open to interpretation and guesswork, addressing important skills and knowledge with the broadest of strokes.

REVIEW BY CRITERIA

Important Subject Matter

The Learning Area of Read, Listen, and View touches upon most important topics of reading, listening and viewing in English language arts. However, most of these topics are addressed only in summary terms, leaving much to interpretation. This lack of specificity will be discussed in Specificity. Additionally, many topics are either missing or inadequately handled. These include:

- *Phonemic Awareness, Decoding and Word Recognition* (no explicit or systematic phonics study included; only the briefest mention of phonics is made and that is with respect to pronunciation only)
- *Vocabulary Development* (no specifics with respect to word origins, such as Greek and Latin roots, derivations, synonyms, antonyms, idioms, roots, affixes; mentions only “demonstrating appropriate techniques for learning new vocabulary”)
- *Text Structures* (such as cause and effect, problem and solution, theory and evidence)
- *Knowledge of Various Literary Genre and Forms* (only mentions differences between fiction and nonfiction; what about, for example, poetry, drama, prose and different forms of each?)
- *Literary Criticism* (i.e., Reader Response, Biographical Approach, Historical, Aesthetic, Political or Philosophical Approaches; only alluded to in summary terms, i.e., “applying specific critical criteria to interpret and analyze the selected art [literary] works”)
- *Literature Study* (no specificity with respect to authors, works or time periods students need to be reading; not much depth with respect to the type of analysis students should be able to conduct)
- *Nonfiction or Technical Text* (no specificity with respect to the types and/or range of materials students should know how to read and comprehend, e.g., newspapers, instructional manuals, warranties, policy statements, speeches, workplace documents)
- *Specific Reading Requirements* (neither amounts nor genres are specified)
- *English Language Grammar and Conventions* (not included except in the most summary of terms, “using grammar, language mechanics, and other conventions”)

It is particularly worrisome that there is so little detail or information provided about expectations for students in primary level reading. For example, a primary level statement calls for students to “draw conclusions based on information in the selection.” This statement might mean that a student makes predictions based on the text and prior knowledge, compares information within a selection or makes a very simple conclusion about a character’s motives. Primary level reading is one of the most important foundation skills, on which all future knowledge and skills frequently depend. Reading at grade level by 3rd grade is one of the main indicators of school success. By leaving the interpretation up to individual districts or teachers, there is no one state standard for this vital skill. Further, this omission leaves a vacuum in terms of what might be assessed in this important area at the state level.

To remedy these problems, the state could consider adding to the existing standards or creating some new ones to adequately cover the missing material.

Rigor and Progression and Grade-by-Grade Development

As mentioned, most reviewers found the statements in Read, Listen and View to be too broad to really identify rigor. For example, students are to “read, listen, and view complex information,” but complex information is not defined for the reader. From what can be identified, however, the standards are not rigorous enough. For instance, skills that are listed for high school students include (from the standard on Reading, Listening and Viewing Complex Information):

- a) identify main ideas and supporting information
- b) distinguish fact from opinion
- c) identify bias, point of view, and author’s intent

These are not very complex for a high school student. In fact, they are strikingly similar to the corresponding statement for *primary* students, who are to demonstrate comprehension by “identifying main ideas and some supporting details.” This is just one example of low rigor when there is little evidence of change from kindergarten to high school. High school students should be able to do more sophisticated work, such as:

- Analyze how the theme and meaning of a selection represents a view or comment on life, using textual evidence to support the claims; and
- Analyze and trace an author’s development of time and sequence, including the use of complex literary devices such as foreshadowing and flashbacks.

The standards for Read, Listen and View were also noted by reviewers as requiring the least amount of higher order thinking skills of the three learning areas pertaining to English.

The low level of rigor is also reflected in the fact that there is little grade-by-grade progression. In some instances, in fact, tasks at a lower level have the potential to be more complex than the parallel task at a higher grade level, or are strikingly similar, as is the case above. For example, at the middle level, in nonfiction, students are asked in part 2 subpart D to identify “differences in points of view of the authors when given more than one selection on the same topic.” This is a

laudable standard, but the parallel statement at the high school level has students “identify bias, point of view, and author’s intent,” and it does not mention whether they are to do this with more than one text.

The state will want to consider editing the standards in Read, Listen and View specifically with an eye to rigor and progression. In particular, tasks should be phrased with verbs that call for more higher-order thinking skills and appropriate levels of sophistication. Additionally, such an edit would ensure that the standards increase appropriately from grade level to grade level.

Balance of Knowledge and Skills

Literature is an important component of English language arts, but it is not given much attention in the Profile by way of citing particular texts or even genres or levels of sophistication of texts students should be able to read by certain grades. The skills of reading, writing, listening, speaking and viewing are mentioned in the document but are not always demanded of students at appropriately rigorous levels. However, several important content areas are also missing from the Minnesota document, as described in Important Subject Matter. In addition, most reviewers commented on the absence of any understanding of a set of recognized works in American and world literature. There are important and enduring themes in literature that students should encounter, such as friendship, freedom, fairness, justice, responsibility or cooperation; and this omission is problematic. There is certainly not enough content for the Profile to be of use to curriculum planners. Finally, while it is admirable to expand student learning experience to include those drawn from the real world, there should not be a false choice between academic content and more real world content, as is implied by these standards. It should be noted that this kind of real world or applied learning material appears only at the upper grade levels.

Specificity

As previously mentioned, specificity is the primary weakness throughout the Learning Area of Read, Listen and View. Topics and skills are covered in the most general sense, leaving important ideas undefined and open to wide interpretation. Statements are certainly broad enough to allow teachers to define their own curriculum, but to a fault. Thus the Profile fails to set any common standards for all Minnesota students. In addition, at the primary level, students are asked to “understand ideas not explicitly stated.” What kinds of ideas are intended, and how will a teacher judge whether students understand? At the same level, students will “draw conclusions based on information in the selection” — but what kinds of conclusions? To remedy this, the state could consider clarifying the standards through an editing process that would add needed specificity.

Measurability and Potential for Instruction

While some statements throughout the Profile use measurable terms, such as identify, construct, analyze and describe; many standards are not measurable due to their vague, ambiguous nature. The standards are written in such a way that a teacher or task developer would have to guess the content that will be measured and the cognitive complexity students at different grade levels will

be required to demonstrate. This works against the goals of a standards-based system — to eliminate the guesswork. Many statements are about processes of learning — not the results of learning — and are much harder to measure, such as “demonstrate appropriate techniques for learning new vocabulary” (primary level, part 6). How would a teacher or test measure this standard? The task-oriented nature of the statements also brings up logistical questions in terms of assessment and measurement. While some standards are generally more appropriately assessed at the local level, there should still be a set of common statewide standards to which all students and all schools are held accountable. An editing process that provided needed clarity and specificity would render the standards more measurable.

Clarity

The standards need work in terms of clarity. Some jargon is used, and parents in particular might have a more difficult time making sense of the standards. The expectations set in the standards lack clarity as well. Additionally, there are a significant number of circular statements that are unnecessarily confusing. For example, the first statement at the high school level reads:

A student shall demonstrate the ability to comprehend and evaluate complex information in varied nonfiction by reading, listening, and viewing varied English language selections containing complex information and, in these selections ...

Notice that the phrases “complex information” and “selections” are repeated twice, making the standard unnecessarily wordy. This problem can be remedied through an editing or revision process.

Focus and Manageability

Because of the broadness of the standards in Read, Listen and View, it appears that very few choices have been made about what is expected of students. Rather, the standards could be interpreted to mean everything and nothing. Goals are not broken down into manageable pieces — both the grade-by-grade expectations and the sometimes lengthy statements describing what students should do are too broad.

Public Support

Any controversy that would arise would do so not because of what is in the Learning Area of Read, Listen, and View, but because of what is not in it — clear expectations of what students are to read, requirements for reading ability and expectations for student vocabulary. The public wants to know that their children are going to be held to high academic standards, but often reacts with frustration when it finds out what the state really means only after test scores are published.

SUMMARY REVIEW
ENGLISH LANGUAGE ARTS
LEARNING AREA: WRITE AND SPEAK

INTRODUCTION

Write and Speak covers most major skills in writing and speaking, but is missing or inadequately addresses many important ones. There is little evidence of the development of these communication skills throughout schooling, and rigor is lacking. More specificity is needed to create a set of expectations of exactly what students should be able to do in the areas of writing and speaking.

Important Subject Matter

As with the other learning areas, Write and Speak does address some important topics of those areas of English language arts, but underemphasizes or omits others. At the high school level in particular, Academic Writing is only referred to in the most general terms; the important elements of essay writing are omitted; research skills are missing; and grammar and conventions are only referred to very broadly. Throughout Write and Speak, vague, broad language weakens the document. Topics that are missing or inadequately described throughout the document include:

- *Research Skills* (i.e., generating ideas and questions; gathering, evaluating and synthesizing information from different sources; crediting sources; and synthesizing information from sources)
- *Aspects of Essay Writing* (i.e., thesis development, paragraphing, coherent organizing structures, transitions/fluency, supporting details, vocabulary choice)
- *Academic Writing* (only referred to in the most summary of terms, “writing original compositions that describe, narrate, or explain observations of human events or situations” which confounds the very different aspects of different genres. For example, it is not clear whether students are to write creative or persuasive pieces)
- *English Language Grammar and Conventions* (not included except in the most summary of terms, “using grammar, language mechanics, and other conventions”)
- *Writing Process* (though there is debate over whether a writing process should be a standard, there is agreement that a stated process can be a very helpful guide for student writers and a useful framework for their teachers. Focus on strategies for writing should be given attention in the document in addition to the types of products required)

Rigor and Progression and Grade-by-Grade Development

Due to broad language — and the choices student and schools have in selecting standards to meet — the rigor of the document is severely compromised. For example, on the issue of grammar and conventions, the most thorough reference of these appears in Academic Writing: “the ability to write using grammar, language mechanics, and other conventions of standard written English for a variety of academic purposes and situations ...” While the document does mention standard written English (a strength), “academic” purposes is too loosely defined. While this standard is somewhat useful, students may not need to meet this standard and might instead meet the requirements of Technical Writing, where they need only use “style and format and conventions appropriate for the audience.” Consequently, some Minnesota high school graduates need not be very adept in writing using standard language conventions, having never been challenged to study and use them correctly.

Some higher level thinking skills are called for, but they are limited and vague, such as “analyze patterns and relationships of ideas, topics, or themes” in the standard for Academic Writing (high school). The rigor of this statement could vary drastically from classroom to classroom. Throughout Write and Speak, expectations, when apparent, are generally unchallenging and require only rudimentary knowledge, particularly for types of writing.

Throughout this section, it is not clear how the forms of writing and speaking become more complex through the grade levels, resulting in a low level of expectation for high school students. For example, at the intermediate level in Speaking, students must “prepare and give a demonstration to an audience” as well as “demonstrate the ability to speak to an audience or interact with a group.” At the middle level, the Profile only requires that students “communicate effectively in a small group.” It is surprising to see that less is expected of students as they move up to the middle level. Similarly, there is little evolution in complexity in the writing areas. The type of writing students need to do at the middle versus the high school level is largely the same, and contains many of the same components. There is no mention of the development of skills in using different organizing structures, for example, or transitions and fluency. There is no mention of development in the quality of writing produced by the student.

The standards for Write and Speak would benefit from some editing, as would the rest of the standards for English language arts, specifically for rigor and progression.

Balance of Knowledge and Skills

Generally, there is an appropriate balance of knowledge and skills in Write and Speak. The standards address mostly skills, which is a tendency found in most sets of standards for English language arts. Students are asked to produce a range of products including writings (original compositions, reports, proposals, informational correspondence, or a set of procedures or directions) and speeches, sometimes in the context of applied learning. However, as previously mentioned, important skills, such as mastering the writing process, are missing; and important content knowledge, such as types and genres of writing, are conspicuously absent, particularly in the standard for Academic Writing and Public Speaking at the high school level and the

intermediate level standard for writing. To make the standards more appropriately balanced, these missing elements should be considered.

Specificity

As with the rest of the Profile of Learning, the lack of specificity compromises the Write and Speak standards. The majority of these standards are general and vague and they require guesswork to understand their intent. For example, at the high school level, students are to:

write using grammar, language mechanics, and other conventions of standard written English for a variety of academic purposes and situations by writing original compositions that:

- a) describe, narrate, or explain observations of human events or situations;
- b) analyze patterns or relationships of ideas, topics, or themes;
- c) construct support for a position, argument, plan, or idea; and
- d) evaluate an idea, topic, or theme based on expressed criteria.

Yet there is no description of the components or quality of writing expected. How, for example, will a two-paragraph description of a student's pet compare to a five-page paper on the character motivations in *Their Eyes Were Watching God*? These are the kinds of questions parents and students will ask when reading the standards, and teachers have little help from the standards in answering such questions.

Similarly, when students are asked to "use appropriate English language conventions" (throughout Write and Speak), what is considered appropriate? What conventions? Students are asked to write for a variety of technical and academic purposes, but those purposes are not identified. Should students know how to write a complex persuasive essay that contains specific characteristics by the time they graduate from high school? What about a personal essay? What type of literary critique should they be able to write? Should they be able to write a chapter of a technical manual or a set of instructions? This is the kind of specificity needed if the Profile is to improve curriculum and instruction in writing and speaking for all students.

Measurability and Potential for Instruction

The measurability of the standards for Write and Speak varies. For the group-oriented elements, such as interpersonal communication, it might be difficult to score individual student work or performance on assessments. Additionally, because so little guidance is given on the types of products (forms of writing, types of speeches) it would be difficult to compare student performance across classrooms, schools and districts. As noted in other learning areas, some statements that would be very difficult to assess or measure at the state level might be better measured at the local level.

Clarity

In general, the standards in Write and Speak are not clear enough, and their meaning is obscured by this lack of clarity. Throughout the document broad phrases are used to indicate content, but are so vague that they could mean virtually everything or nothing. For example, the phrase used

in high school Academic Writing, “analyze patterns and relationships of ideas, topics, or themes,” is not clearly defined. Analyze patterns and relationships for what? What kind of analysis? What exactly is expected here? Lack of specificity here inhibits clarity. Contrast this with excerpts from Massachusetts’ standards:

- Write coherent compositions with a clear focus and adequate detail, and explain the strategies they used to generate their ideas.
- Compare and contrast the presentation of a similar theme or topic across genres to explain how the selection of the genre shapes the message.
- Apply knowledge of the concept that the theme or meaning of a selection may involve several ideas and then analyze and compare works that express a universal theme, providing evidence to support their ideas.

Note that the Massachusetts standard gives specific expectations for what the student should be able to do: Compare and contrast the presentation of themes, apply knowledge about themes — these standards have students engaging in analytical writing. The expectations for the students’ writing products are equally clear. This level of detail is missing from Minnesota.

Focus and Manageability

All reviewers seemed to agree that the standards are manageable in that not very much is expected of students. Further, the standards are so broad that too much could be interpreted differently, resulting in a lack of common expectation of what is required in the field of English language arts to obtain a high school diploma.

Public Support

Any controversy that would arise would do so not because of what is in the learning area of Write and Speak, but because of what is not in it. What exactly is expected of students in terms of writing ability, forms of writing, and writing processes is not clear. The public wants to know that their children are going to be held to high academic standards, but often reacts with frustration when it finds out what the state really means only after test scores are published.

SUMMARY REVIEW

LEARNING AREA: MATHEMATICAL CONCEPTS AND APPLICATIONS

SUMMARY

The primary issue with the standards in Mathematical Concepts and Applications is a lack of clarity and specificity. The standards are frequently so vague that it is difficult to tell what is really being asked for or how rigorous the standard is. CBE and Achieve recommend that the state consider revising the standards for mathematics with an eye to increased clarity and specificity by expanding or elaborating on the existing standards. Providing examples or sample problems also might be helpful.

INTRODUCTION

The Learning Area of Mathematical Concepts and Applications is organized somewhat differently from the math standards of other states and countries, but contains the same broad areas of content. These areas correspond to the recently released Principles and Standards for School Mathematics by the National Council of Teachers of Mathematics as follows:

| <u>NCTM Content Standard</u> | <u>Minnesota Profile of Learning</u> P=Primary; I=Intermediate; M=Middle; H=High School |
|--|---|
| Number and Operation | Number Sense (P,I,M) Discrete Mathematics (H) |
| Patterns, Functions, and Algebra | Number Sense (P, I) Space, Shape, and Measurement (P, I) Patterns and Functions (M) Algebraic Patterns (H) Discrete Mathematics (H) |
| Geometry and Spatial Sense | Space, Shape, and Measurement (P, I, M, H) Technical Applications (H) |
| Measurement | Space, Shape, and Measurement (P, I, M, H) |
| Data Analysis, Statistics, and Probability | Data Categorization, Classification, and Recording (P) (Inquiry) Chance and Data Handling (I, M) Chance and Data Analysis (H) |

Therefore, as displayed above, Minnesota's content strands can be aligned loosely to those of the NCTM, showing a general correspondence between the two documents. Minnesota's standards also do a nice job of tying in problem solving. Students are often asked to use what they have learned, and to use it in both conceptual and practical ways.

However, the primary issue with the Learning Area of Mathematical Concepts and Applications is an overall lack of clarity and specificity. Throughout the document, there is not enough detail to determine what is really meant by the document's authors and, thus, what students are really expected to know and be able to do. This vagueness clouds one's ability to review the standards against the other criteria because there is not sufficient information. Thus, clarity and specificity will be discussed first in this review, followed by a discussion of what can be ascertained about the other criteria components.

REVIEW BY CRITERIA

Clarity and Specificity

Standards are intended to make expectations absolutely clear for teachers, students and the public. This is particularly important in today's climate of high-stakes accountability. The teacher, the student, and creators of assessments must share a common understanding; and this can occur only when standards are explicit and precise. A document that can be interpreted in a variety of ways by a variety of people, at best, creates confusion and, at worst, creates a situation that is unfair to children by holding them accountable for material that they might never have learned. Many, if not most, of the standards in Mathematical Concepts and Applications lack sufficient clarity. This lack of clarity presents itself in three ways.

Usually, the document's lack of clarity is directly tied to a lack of specificity or detail. In the middle level in Number Sense, for example, students are asked to "create a real-world communication that demonstrates the ability to use a variety of numbers in context." One can imagine some very spirited discussions about what "real-world communication" looks like for middle school students who are using "a variety of numbers in context." What kind of communication? What kind(s) of numbers? What context? Contrast this with North Carolina's standard #7.3, "Apply the concepts of ratio, proportion and percent to real life situations such as consumer applications, science and social studies." North Carolina further clarifies its expectations with sample problems such as, "A recent telephone poll of 1558 North Carolina citizens indicated that 56% of them thought the governor was doing a good or excellent job. If these results were from a representative sample, how many North Carolinians approve of the governor's job performance?"

Additionally, sometimes the lack of clarity is a result of garbled language. For instance, at the middle level in Space, Shape and Measurement, Statement 5 reads:

measure length, mass, perimeter, and area of quadrilaterals and circles, surface area, and volume of solids and angles, including determining the type of measurement needed (exact, approximate, derived), selecting appropriate measurement tools and units, and measuring to the appropriate accuracy;

How does one measure the volume or mass of an angle? Why are angles even included in this statement? In an attempt to be parsimonious, poorly punctuated, run-on sentences are sprinkled throughout the Profiles of Learning.

A better example of these concepts can be found in Indiana's set of seven standards for grade 6. Note the level of detail and clarity with which concepts are spelled out.

- 6.5.1. Understand the concept of the constant π as the ratio of the circumference to the diameter of a circle. Know the formulas for the circumference and area of a circle.
Example: Measure the diameter and circumference of several objects. (Use string to find the circumference.) With a calculator, divide each circumference by its diameter. What do you notice about the results?
- 6.5.2. Know common estimates of π (3.14, $22/7$) and use these values to estimate and calculate the circumference and the area of circles. Compare with actual measurements.
Example: Find the area of a circle of a radius 15 cm.
- 6.5.3. Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area of these objects.
Example: Find the total surface area of a shoe box with length 30 cm, width 15 cm, and height 10 cm.
- 6.5.4. Know and use the formulas for the volume of triangular prisms* and cylinders (area of base x height). Compare these formulas and explain this similarity between them and the formula for the volume of a rectangular solid.
** Triangular prisms: solid shapes with fixed triangular cross sections*
Example: Find the volume of a cylindrical can 15 cm high and with a diameter of 8 cm.
- 6.5.5. Convert common measurements for length, area, volume, capacity, weight, and time to equivalent ones within the same system.
Example: How many feet are in 7 miles?
- 6.5.6. Convert temperatures between Celsius and Fahrenheit.
Example: What is the Celsius equivalent of 100 degrees Fahrenheit?
- 6.5.7. Recognize that measurement has applications in science, social studies, home economics, and other subjects.
Example: Measure the amounts that a spring is stretched under different weights.

A third cause of lack of clarity in Minnesota's document is the sheer volume of content that is packed into some of the expectations. Statements that are actually lists of mathematical concepts are conceptually difficult for most people to interpret. For example, in the primary Level of Number Sense, standard 3, below, has so many ideas it becomes difficult to comprehend:

solving problems and justifying thinking by selecting appropriate numbers and representations; using operations, patterns, and estimations; generating multiple solutions; organizing data using pictures and charts; and using concrete objects, diagrams or maps to solve simple problems involving counting, arrangements, or routes.

This lack of clarity and specificity can be remedied through editing or revising the standards to include more detail and more specifics about what the students should know about the listed topics, such as place value. Providing examples or sample problems would also be helpful.

Important Subject Matter

In many cases, important subject matter can be inferred. For example, at the primary level, students are expected to “demonstrate an understanding of place value.” Place value is a fairly straightforward concept around which there is a great deal of agreement. The assumed intent for students to gain the skill set is described in Arizona’s Foundations Standards, which reads:

- Relate counting, grouping and place-value concepts to whole numbers (e.g., reading and writing the number represented when objects are grouped by thousands, hundreds, tens, and ones)
- Read whole numbers up to one thousand
- Write whole numbers up to one thousand
- Order whole numbers (e.g., smallest to largest, largest to smallest) up to one thousand
- Write a whole number in expanded notation (e.g., $531 = 500 + 30 + 1$)
- Read aloud a whole number with correct place value words (e.g., a student will read 5 2 1 as “five hundred twenty-one”)

In cases such as this, when the subject matter is inferred, the Minnesota standards can be said to contain important concepts and processes.

In those areas of mathematics where there is less likelihood of a shared vision, however, more guesswork is required. For example, the primary level standard 3 for Number Sense reads:

- A student shall use number relationships to represent information and solve problems by:
- 1) using whole numbers to represent numbers in more than one way, count and order, name and locate, measure, and describe and extend patterns;
 - 2) demonstrating an understanding of place value, number relationships, relative size, and reasonableness of answers in problem-solving situations ...

This could be interpreted by different teachers in widely varying ways due to differences in the ways teachers view the importance of memorizing basic mathematics facts. Maryland limits the possibility of widely varying interpretations by specifying that by the end of grade 3 all students will know and be able to:

- add and subtract multi-digit whole numbers using models and algorithms
- multiply and divide whole numbers using models
- use the properties of operations (for example, commutative for addition and multiplication)
- use the relationships among operations (for example, subtraction is the inverse of addition)
- apply estimation and computation strategies to solve problems involving whole numbers
- evaluate reasonableness of results

While an individual may disagree with some of these standards (whether students should also be required to know their multiplication and division facts by the end of grade 3, for example), there is little room to misinterpret them. The state may wish to clarify its standards to lessen the

possibility that some students will, in effect, be held to different expectations than others; and yet go on record as meeting the same standard.

Additionally, important content is sometimes completely missing. In the section on Shape, Space and Measurement, there is no mention of students applying the ideas of direction, distance and relative position of objects in space. One could also reasonably expect students to be able to recognize and use a core set of attributes such as length, capacity, weight, area and time; but this section makes no such specification. The state may wish to clarify the standards so that all important content is clearly included.

Rigor

While the overall rigor of the document is impacted by the lack of clarity, there are other indications that the document is less demanding than many others are. At the intermediate level, for example, students should be able to “use whole numbers, simple fractions, and money amounts to quantify, label, measure, and locate numerical information.” This should be expected earlier, at the primary level. Fifth and 6th grade students are capable of much more comprehensive and sophisticated skills relative to fractions and decimals. They should understand and be able to write fractions and decimals; they should have strategies for determining the relative size of fractions and decimals (e.g., .75 is bigger than $\frac{1}{2}$); they should be able to recognize and use fractions, decimals and percent equivalents ($\frac{1}{3} = 33\% = .3333$). In fact, by the end of grade 6, formal teaching of fractions, decimals and percents should be complete.

The intermediate level expectations associated with chance and data handling are similarly weak. They do cover the basic probability and statistics knowledge that one would expect of grade 5 students. However, students at that level are capable of more sophisticated skills beyond conducting experiments, collecting data, and organizing, representing, and communicating it. They also can formulate questions they want to study and/or the hypotheses they are proposing; and design an investigation to address those questions. They also are able to understand and make judgments about data collection methods and apply the basic concept of representativeness to a sample.

The coverage of algebra skills by this learning area serves as another example. Knowledge of algebra by grade 8 has been shown to be fundamental in student success. Yet, several important elements of algebra seem to be missing from the middle level standards. For example, while students are to “use patterns and concepts of algebra,” it is not clear if they are to actually solve equations. By contrast, North Carolina’s standards for 8th grade lay out the following:

The learner will solve equations and inequalities with one variable.

3.1 Solve a simple equation by using the addition property of equality and the idea of additive inverse.

- 3.2 Solve a simple equation by using the multiplication property of equality and the idea of multiplicative inverse.
- 3.3. Solve an equation graphically and by using more than one property ...

These standards set a much clearer, and therefore more rigorous, expectation.

Another example of the lack of rigor can be found at the high school level in geometry (Shape, space and measurement). Nowhere does it say, for example, that students must know the Pythagorean theorem — something that is found in most good math standards. While it is often debated whether high school students should understand right triangle geometry, the standards do not take a clear stand.

Rigor is also impacted by the amount of choice students might have in meeting the standards. While one reviewer found this to be an innovation and an intriguing idea, it was also noted that this system is fraught with possible difficulties. If one district's requirements are actually less rigorous than the requirements of other districts, is it fair for students in District A to graduate from high school with significantly lower math skills than the students just across the way in District B?

CBE and Achieve believe, however, that most of the issues with rigor can be resolved by improving the clarity and specificity of the standards.

Balance of Knowledge and Skills

The document includes both knowledge and skills; although in mathematics they are usually called content and processes standards. Most of the comments thus far have focused on the content part of the document. The lack of clarity, specificity and rigor also contribute to issues with balance. Since most standards are not clear enough, both content and processes are lacking somewhat. Overall, though, Minnesota has done a nice job of integrating the two aspects of mathematics. Some state standards documents go too far in one direction or the other listing too many skills without concepts or describing concepts without the skills needed to understand them. Minnesota has avoided either extreme, but will be well served to further develop both aspects of their standards and to include clear directions on what is expected in the area of technology.

Progression and Grade-by-Grade Development

In general, Mathematical Concepts and Applications does not provide the necessary scaffolding to ensure that all students build the needed skills. For example, while students at the primary and intermediate levels are required to describe, extend and use patterns, the foundation is not laid for students at these levels to build the algebraic skills and knowledge they will need to handle algebra at a more intense level in middle school and high school.

This sort of gap in the progression of knowledge in this learning area is frequently associated with the lack of clarity and specificity in the requirements. For example, if there was clearer articulation of what is expected of students at the primary and intermediate levels in terms of

mastery and fluency of computational skills with whole numbers, fractions, decimals and percents, it would be more apparent when the content focus can transition to greater emphasis on algebraic, geometric and measurement content.

In the last few years since Minnesota completed the development of the Profile of Learning, state after state has found that the various groups of stakeholders want as much specificity and clarity as possible. One way this is being achieved in many states is through grade-by-grade standards. Other states provide more detailed and specific curriculum frameworks that give examples of how to break down standards for grade levels into individual grades. Should Minnesota decide to provide some additional information — such as detailed topics and expectations for what students should know about those topics — some of the needed clarity and specificity will be provided.

Measurability and Potential for Instruction

While the verbs utilized in Mathematical Concepts and Applications are certainly measurable — such as gathering, developing, evaluating, creating, designing — there are some exceptions: “Demonstrate understanding,” for example, is often too unclear to measure in a classroom or on an exam because the depth of learning is not specified. However, in general, reviewers did not feel that the document was measurable enough to stand alone as a guide for a state assessment, or to truly be of use to teachers, due to the lack of clarity about what is actually expected of students. For example, when students are “selecting appropriate tools and units of measurement and measuring accurately,” it immediately begs the question of “how accurately?” Mathematical Concepts and Applications would be much improved with the addition of performance standards so that teachers and administrators will have a guide to how well their students are doing. Additionally, in cases where the only specification is that the student should “demonstrate understanding,” careful choice of language can make it clearer what sort of knowledge or skill is expected of the student.

There are two strategies that are not necessarily mutually exclusive that Minnesota could consider: The first is to include examples within the standards themselves — as does Maryland in their standard 6.3.1: “identify the relationship between two- and three- dimensional figures (for example, the face of a cube is a square).

A second way to add the needed clarity is to include sample problems. Achieve’s MAP document illustrates an effective use of this strategy. Here is how Achieve clarifies expectations related to multiples, factors, primes, and prime factorization:

Expectations

MULTIPLES, FACTORS, PRIMES, PRIME FACTORIZATION

By the end of grade 8, students should be fluent with whole numbers and be able to use relationships among whole numbers to solve problems. In particular, students should:

- know what divisors and multiples are and be able to find them
- know and be able to find common divisors and the greatest common denominator (GCD)
- know and be able to find common multiples and the least common multiple (LCM)
- know what prime numbers are and be able to identify them
- be able to find a number's prime factorization and understand that this factorization is unique.

Illustrative problems

Find the multiple of 13 that is closest to 100.

Factor the following numbers into their prime factors and express them using exponents: 36, 60, 375

A piece of cloth is 56 centimeters long and 84 centimeters wide. We would like to cut square handkerchiefs of the same size without leaving any unused cloth. If we make the largest handkerchiefs we can, what would be the length in centimeters of the side of each handkerchief?

There are two comets, A and B . A comes close enough to the earth to be observed every 76 years, and B comes close enough every 8 years. If we can observe both of the comets from the earth this year, how many years will it be before we can see them both in the same year again?

Focus and Manageability

It is clear that Mathematical Concepts and Applications was of course, written with a focus on applications as well as with the idea of allowing students to choose what the focus of their mathematical education will be. However, as discussed elsewhere in the review of the Profile, this focus on choice still results in students not gaining all the knowledge and skills they may need, omitting important topics or creating a situation where there is no common understanding of what a high school diploma means for all students. The intent of standards is to avoid this situation. In terms of the focus on applications, as one reviewer commented, this attempt suppresses the hierarchical nature of mathematics and results not in a clear, focused parsimonious discussion of mathematics; but instead in a list of topics that winds up being everything or nothing, thus containing no real focus at all. By expanding and clarifying exactly what knowledge and skills students should have, the standards can gain some focus.

Public Support

One of the main “red flags” that arises with standards for mathematics is the use of technology — particularly calculators. As with other areas, the Profile is vague about the use of instructional technology. The use of calculators is not explicitly mentioned until the middle level, where students are to “evaluate the reasonableness of computed results to problems with proposed

solutions,” although the extent or limitation of the use of calculators in this is not defined. Proponents of using technology at the earlier grades will likely be displeased by its omission in the primary and intermediate levels. Opponents of the use of such technology may be concerned by its explicit inclusion at the middle and high school levels. However, as one reviewer put it, “the devil is in the details.” Since the details are not clear, there is less of a chance of opposition to this section due to concerns over technology.

COMMENTS ON ADDITIONAL QUESTIONS FOR MATHEMATICS

1. *Are the math “basics” — arithmetic/computation and other fundamentals — well covered in elementary mathematics?*

Reviewers tended to feel that the math basics were not adequately covered in the Profile. At the primary level, number operations are mentioned only in the context of solving a problem. At the intermediate level, there is a little more coverage, although the language is garbled. However, many other basic concepts are missing: The basics of integers, fractions, and decimals and their interrelationships, and an introduction to the concepts of length and area are two that were noted.

2. *How do the standards deal with controversial issues, such as calculators (when, how used)? In what way do they deal with the sophistication level and frequency of statistics and probability?*

Calculators are not discussed in any detail. They are mentioned at the intermediate level, but not in terms of the extent or limitation of their use.

Statistics is dealt with reasonably in the earlier grades. At the middle and high school levels they are so vague, however, as to be overwhelming to teach.

3. *To what extent do the standards outline the sophistication of algebra and geometry needed in the middle grades and in high school, particularly in the context of preparing students to meet the demands of higher education?*

There are weaknesses in the coverage of algebra. They do not clearly specify the inner logical cohesion one might find in more rigorous standards; and the idea of a variable is not specifically mentioned at the intermediate level, although it would be reasonable to do so by grade 6. At the high school level, the options available to students raise an issue. It is questionable whether students who do not select the Algebraic Patterns option will receive a solid enough foundation of mathematical study.

4. ***Do the standards include the essential concepts and skills at the level of sophistication contained in the best standards in the nation and world?*** Some reviewers felt the standards were too vague to compare with other benchmarks. Others felt that, due to that vagueness, Mathematical Concepts and Applications falls far short of the best standards in the nation and the world.

SUMMARY REVIEW

LEARNING AREA: SCIENTIFIC CONCEPTS AND APPLICATIONS

SUMMARY

Overall, the standards in Scientific Concepts and Applications are weak. They are too vague and there is an imbalance between content and process. Important concepts are not covered in enough detail, and skills are organized in a confusing manner; they are split between this learning area and Inquiry and Research; and within Scientific Concepts and Applications they are repetitive and convey the impression that inquiry exists in a vacuum, outside of the content it seeks to explain. Achieve and CBE recommend that the state consider a series of revisions to improve the standards for science: First, consider increasing the detail of the standards so they are more clear; for example, what about the functions and processes of the human body students should know. Second, consider not having the processes that repeat in each standard at the high school level and instead put them in a separate standard, to make the standards easier to read.

INTRODUCTION

The Learning Area of Scientific Concepts and Applications focuses on experiencing and applying science throughout the grade levels, with less emphasis on the facts and theories of scientific understanding. At the primary level, students learn about a wide variety of basic science concepts through direct experience, including activities such as observing the world around them and making observations. At the intermediate level, students' knowledge is broken down into living and nonliving systems and the processes of understanding them. At the middle level, three sections (entitled Living systems, Earth systems, and Physical systems) describe the concepts students are to learn followed by a list of the processes used in understanding, which are identical for each section. At the high school level, there are five sections (of which students must choose two): biology, chemistry, earth and space systems, physics, and environmental systems. These, as at the middle level, have a part A that lists the concepts of the topic and parts B through E that describe sets of processes students are to use in learning those concepts. These processes are identical in each section, with the exception of environmental systems.

Through this emphasis on processes, it is assumed, the statements contained in the Learning Area of Scientific Concepts and Applications make a worthy attempt to encourage the use of higher order thinking skills in science education in Minnesota. At the primary and intermediate levels, the document calls for an activity-based program that is likely to excite and interest young children. However, as a standards document with the objective of raising the bar in the area of critical thinking skills, this document fails for several reasons. First, it fails at being a set of content standards — a document stating what both students should know and be able to do. The content — the concepts, elements, principles, and components of science — is vague and inadequately defined and left to the guesswork of teachers, curriculum staff and assessment developers. The standards are so broad that they imply both everything and nothing; students might “meet the standard” and yet still have a very limited range of knowledge. The rigor of

science education based on this learning area will vary widely across students and schools, and what is actually expected of students is largely unclear.

Second, while de-emphasizing that content to focus on processes, processes are covered in a manner that undermines the goal for student attainment of higher order scientific skills. Higher order thinking skills cannot be attained in a vacuum; they must be presented in the context of the content to be learned. By repeating identical processes with varying areas of content, it is incorrectly implied that there is one scientific method applicable to all questions, phenomena or situations confronting a scientist or student of science. Furthermore, these processes as written are often incomplete, leaving out at the intermediate level — for example, the important steps of asking questions, designing experiments, developing explanations, comparing explanations to known science and communicating the results and explanations to others. Finally, the statements of process are also overly specific, in contrast to the rest of the Profile, lessening the possibility that teachers and students will be creative. Instead, these are more likely to lead to “cookbook labs” that are less likely to contribute to students’ understanding of science.

It also fails in its attempt to not be a curriculum. While the content is not specific enough, the processes are too specific — so specific that they really are a jumble of complex, over specified performance tasks that specify exactly how teachers should teach science — surprising given the emphasis throughout the rest of the Profile on leaving as much as possible up to the local level.

In other words, this document confuses expectations for student learning with educational experiences. The standards tangle what is to be learned with methods for instruction. Throughout the standards, the language shifts from describing content and skills and describing how content should be imparted to students to describing what students are to do and describing the understanding and abilities they are to demonstrate.

REVIEW BY CRITERIA

Important Subject Matter

Primarily, the reviewers for science felt that there was not enough specificity in the document to reveal if in fact the document contained important subject matter. The broad topics listed did not provide enough information to determine what was actually expected of students. Given that, some reviewers noted that some important topics appear to be missing, including:

- the omission of history of science before high school;
- not enough technology;
- the omission and under-emphasis of important science processes including asking questions, designing experiments, developing explanations, comparing explanations to known science, and communicating results and explanations to others;
- stoichiometry;

- naming compounds;
- electrochemistry;
- dissection work; and
- survey of phyla.

The omission of the word “evolution” was also noted as problematic. Other states have had lengthy debates about whether or not to include this term as well. While some parents and communities might object to the teaching of evolution for religious reasons, it is generally part of the content students should know — particularly if they are college-bound — since it is a foundational concept that would affect a student’s success in college-level science classes.

At a larger level, it was noted that this learning area is missing an understanding of themes that run throughout science, such as constancy and change, the notion of systems, evolution and equilibrium. These ideas are not employed as themes but as isolated concepts, further limiting the ability of the standards to move toward more critical thinking skills.

Reviewers found it difficult to truly compare the Minnesota document to high-quality standards for science around the country and world because of its broad nature. However, it was noted that compared to national standards, Minnesota overemphasizes process and significantly underemphasizes content. Achieve and CBE believe this can be remedied through editing and revising the standards; the state should consider finding a way to add the important missing content and detail to the standards.

Rigor

There is rigor in the intent of the standards; many ambitious and educational activities are described. Ultimately, however, the reviewers found it impossible to determine the rigor of Scientific Concepts and Applications. The level of rigor is, rather, entirely flexible. Students could meet the standards with a lot of knowledge or very little. For example, the intermediate statement for Living and Nonliving Systems requires that “a student shall demonstrate the ability to ... measure and classify objects, organisms, and materials on the basis of properties and relationships.” One teacher may interpret this to mean that grade 5 students should be able to collect and separate marbles based on their color, while another teacher may interpret the same standard to mean that grade 5 students should be able to collect and classify insects from the playground based on the food they eat. These two interpretations of the same standard reflect a wide variance in the level of intellectual and scientific rigor required by the student to meet the standard. In fact, depending on interpretation, the standards could also be considered too hard and too exhausting, or not very challenging. Consider the following standards from Delaware, which provides more guidance:

By the completion of grade 3, students will know that objects can be classified according to physical properties such as shape, size, weight, texture, color, and material composition such as wood, metal, plastic, or cloth ...

and students will be able to:
(Grade 4) observe and describe structures in living organisms (plants and animals) that enable them to reproduce, grow, and survive in their environment.

Note that here, instead of saying only that students should classify items based on properties and relationships, the Delaware standard is much clearer, giving examples of properties and elaborating on what is important for students to know about organisms.

The level of rigor is also prone to variation given that at the high school level, the state's recommendation only requires students to choose two of the five sections. This renders any standards for high school chemistry, physics, biology, environmental science, and earth and space science optional; and there is no consistent expectation of scientific knowledge and skills for all high school graduates. Again, careful editing could improve the rigor of the standards for science.

Balance of Knowledge and Skills

The balance of knowledge and skills is heavily, and frequently too heavily, weighted towards processes. However, the balance is strongest in the primary and intermediate standards. The intermediate standards in particular are the best example of integration of knowledge and skills — an integration that needs to be improved throughout the document. Overall, the reviewers did not react positively to the short lists of topics with lengthy and repeated processes, the process used in the middle and high school sections. That format, in particular, allows for great divergence of student mastery, as mentioned earlier. Reviewers also noted that when compared to documents such as the *National Science Education Standards* and the *Benchmarks for Science Literacy*, the Profile overemphasizes the processes of science.

In terms of knowledge, reviewers felt that the statements in Scientific Concepts and Applications are not really applications but a simplistic listing of a few broad topics. The content contained in those statements is generally inadequate to serve as a guide to teachers about what students should know.

Added detail and specificity about what students are to know about the listed topics would improve the balance of knowledge and skills in these standards. Additionally, missing topics could be added.

Progression

Most reviewers felt that the format and arrangement of Scientific Concepts and Applications inhibited understanding of progression; the document they received had no grade level distinctions on it, and content and process are treated together at the primary level and separately elsewhere. The optional nature of the high school level statements also complicates the intended progression. For example, students who opt out of chemistry and physics at the high school level but still take environmental science will be at a disadvantage, since their knowledge of those topics will only be at the middle school level.

However, at least one reviewer felt that the jump in expectation from middle to high school was too much, further indicating the degree of interpretation and guesswork needed to understand the statements.

In terms of redundancies, the reviewers found that repeating the process skills in each subsection is very redundant and repetitive of the skills included in the Inquiry Learning Area. The state could consider reorganizing Scientific Concepts and Applications to avoid repeating these same four sections (at the high school level) over and over again.

Finally, reviewers noted that linkages between grade levels need to be more explicit, as the standards at the upper two levels are very repetitive without much gain in clarity or content.

Specificity

All reviewers agreed this was the greatest deficit in the Minnesota science standards. For example, in intermediate statement A number 2: “A student shall demonstrate understanding of basic structures and functions of the human body.” Which structures and functions, and what about them should a student understand? Is the kidney more basic than the adrenal gland that sits on top of it? Compare this to the Delaware benchmarks for the 3rd grade:

- identify different parts of the body (eyes, bones, muscles, heart, etc.) and explain what functions the specific body parts perform
- select several body parts and explain how the parts work together to perform different body functions (eating, talking)
- recognize that the human brain sends messages to all body parts so that they work properly and work together ...

Note that the Delaware benchmark gives clear indication about what concepts students should know rather than listing a topic without any detail as to what about that topic was important.

At the middle level, students are to “demonstrate understanding of the fundamental laws and concepts of the physical world including properties of matter, physical and chemical changes, transfer of energy, and force and motion ...” Which are the fundamental laws and concepts? Does the statement intend to include heat energy or chemical energy? What about the density and heat capacity of matter? These are important concepts for middle school students; but whether or not this statement includes them is complete guesswork. Thus the knowledge students are to gain in science is left completely up to the individual teacher, and the state cannot legitimately say it has statewide high expectations for its students. Nor do teachers and district officials have enough guidance to adequately develop a curriculum.

There was agreement that while the content in Scientific Concepts and Applications was not specific enough, the process domains were too specific. Their length and specificity, as mentioned earlier, are the sort that can lead to “cookbook labs” that do not result in improved student learning.

Reviewers mentioned the importance of having some companion document to guide teachers in issues including time management, types of laboratory activities, areas of emphasis and more detailed understanding of what knowledge is expected of students. This is another option the state could consider.

Measurability and Potential for Instruction

The opinion of the reviewers on the measurability of the standards was mixed. Some reviewers felt that the lack of specificity and the entanglement of content with methods of instruction render achievement of the standards nearly impossible to measure. Others felt the standards were mixed in this department; standards for the earlier grades could be fairly measured, while the more process- and performance-oriented standards for the upper grades would be unwieldy; the skills, so clearly laid out, could be measured easily, while content knowledge, usually contained in the hard-to-measure phrase “demonstrate understanding of” would be much more difficult.

Clarity

As mentioned many times above, exactly which knowledge and skills students are to have is not entirely clear due to the broad nature and lack of specificity in the standards. In terms of language, the standards are written with clear language and avoid the use of jargon — something all reviewers agreed upon. Some of the technical language, however, might prove to be confusing to some parents and teachers, particularly those without a strong science background. A glossary might remedy this.

In terms of format, most reviewers found the format of the standards confusing. The document they received did not include grade numbers, so it was difficult to tell what “intermediate” meant, for example. The order of the standards, starting at high school, then primary, intermediate, and then middle, added to the confusion. Finally, the format of the standards switched from using letters and numbers at some levels to just numbers, which many found confusing.

In terms of content, having several of the standards repeated verbatim across grade levels added to confusion. And overall, the expectations set for students are not clear at all. Reviewers were particularly concerned about the statement at the intermediate level, which stated that, “A student shall demonstrate an understanding of characteristics of the physical world.” (A-5) This statement is too broad to effect useful instruction.

Focus and Manageability/Potential for Instruction

Because the standards could be interpreted as including everything or including nothing, they do not represent choices made about what students should know or any attempt to avoid a curriculum that is a mile wide and an inch deep. In fact, because of the broad nature of much of the content, they may make the problem of in-depth coverage even worse in Minnesota schools, as teachers try to cover every possible topic to ensure their students are prepared for any assessment.

One choice that is evident is the decision to focus on skills as opposed to content. This would represent a significant change from the way most teachers in America and, likely, Minnesota teach, but sufficient information to help teachers make that transition is not present in this document. This decision is also inconsistent with the standards written at the national level as well as in other states.

Public Support

Many reviewers thought the public might be concerned about the lack of content in the standards or the lack of guidance provided to teachers. Others felt that the nature of the performance task-like skills would prove to be exhausting for students and teachers and, thus, unpopular. Finally, as mentioned previously, the shift to a focus on skills and processes might be of concern to the teachers, who may not be prepared to implement such a choice.

SUMMARY REVIEW

LEARNING AREA: SOCIAL STUDIES

SUMMARY

The standards for social studies in the Profile of Learning are weak. In general, they lack needed specificity and detail needed for clarity and many important topics are missing or under emphasized. There is too much of a focus on the U.S. and not enough on the rest of the world. Additionally, there are many cases where too many concepts are condensed into one sentence within a standard, sacrificing clarity and specificity for brevity.

CBE and Achieve believe that the general structure of the social studies standards can be maintained, but that to best improve the standards, the state will want to consider ways to revise and supplement the standards with additional detail and specificity. Additionally, some standards could be reorganized or merged. Finally, an introduction to the standards would be a helpful tool in explaining why certain choices were made in the development of the standards and describing the guiding philosophies behind social studies education in Minnesota.

INTRODUCTION

Social studies includes history, geography, citizenship and the skills related to understanding them. The high school level standards include Themes of U.S. History, U.S. Citizenship, Diverse Perspectives, Human Geography, Institutions and Traditions in Society, and Community Interaction. Each of these sections includes a list of broad topics and ways to study these topics. Middle school students have the options of Current Issue Analysis, Geography and Culture, and History and Citizenship. At the intermediate level students study Historical Events and Geography and Citizenship; at the primary level the expanding environments schema is utilized in Family, School and Community.

These standards for social studies are generally weak. They lack sufficient content for what students are to know and be able to do; they are uneven and inconsistent in the level of specificity offered; many skills and concepts are missing; they do not offer a clear set of standards to which to hold students; the level of rigor is frequently weak; and the emphasis on diversity is poorly executed.

An additional concern with social studies is the optional nature of many of the standards. Prior to May 2000, a student could complete the Profile without ever gaining an understanding of high school geography, for example. Some standards contain significantly less content and rigor, and yet could suffice for a student's education in the social studies. Community Interactions, for example, allows students to do some community service and thus avoid any study of high school geography and engage in analysis of institutions in society, which seems insufficient as a rigorous standard for high school graduation.

Another note on the organization of social studies: Some statements are organized by letters, others by numbers. This, in addition to other confusing elements of layout (no grade levels, varying sentence structure, long, run-on sentences, order of sections) makes the document confusing and harder to read.

To simplify the analysis by criteria, the sections of Social Studies are addressed in several categories: history, civics, geography, and other.

HISTORY

It is clear that the standards pertaining to history have set out to give students the opportunity to interact with history and intend to have students relate history to their lives. However, these standards pertaining to history and history skills are weak. There is a lack of specifics needed to make this a useful document for guiding teaching and learning, and many important topics are missing altogether. The expectations are uneven, ranging from the vastly broad to the narrow and over-specific, and for the most part serve as a broad list of topics. The standards could be improved by supplementing and/or revising the existing standards with more detailed information about what students should know about the topics listed, and which topics are the most important for them to know and understand. Furthermore, world history needs to be more fully incorporated into the social studies standards.

In pursuit of the study of history, at the high school level students might complete Themes of U.S. History and Diverse Perspectives; at the middle level, History and Citizenship; at the intermediate level Historical Events; and at the primary level Family, School and Community. There is no standard for Western Civilization or World History; there is a World History standard in Inquiry and Research, but it does not adequately set expectations for what students should know about world history.

Important Subject Matter

In addition to Clarity and Specificity, Important Subject Matter reveals the most key gaps in the standards for history. The statements in these sections do not clearly spell out the content and skills that students need to have for a thorough history education. Up to the middle level, no specific concepts or topics of any kind are spelled out for teachers and students; instead, at the intermediate level students are to “demonstrate knowledge of historical events and contributions of key people from different time periods ...” and at the middle level they “demonstrate knowledge of the facts and sequences of historical events.” At the primary level the influence of the “expanding environments” curriculum, which has students learning about their home, school and neighborhood, with an expanding boundary as they grow older, is seen as students are limited to knowing the “interaction between family, school, and community.” Consequently, there is no standard for what history students shall know.

There is particular cause for concern at the primary level with the limiting focus of family, school and community. Primary students are quite capable of understanding that there is a long ago and far away, and in fact this is often what captures them most. This section instead focuses

on teaching students things they already know or learn quite readily from parents and other community members — topics that can be boring for children. Stories about people such as Pocahontas, George Washington, Booker T. Washington, Daniel Boone or Benjamin Franklin are a good way to introduce young children to history, as are the purposes of and people/events honored in commemorative holidays. Myths, legends and folklore — and the history connected to them — provide a rich opportunity to have children gain a base of historical knowledge. Good examples of this can be found in the California history/social science framework:

Kindergarten: Students understand that history relates to events, people, and places of other times, in terms of the purposes of, and events and people honored in, commemorative holidays, including the human struggles that were behind the events ...

First Grade: Students compare and contrast everyday life in different times and places around the world and recognize that some aspects of people, places, and things change over time and others stay the same ...

Second Grade: Students understand the importance of individual action and character and explain how heroes from long ago and the recent past make a difference in others' lives (e.g., biographies of Abraham Lincoln, Louis Pasteur, Sitting Bull, George Washington Carver, Marie Curie, Albert Einstein, Golda Meir, Jackie Robinson, Sally Ride) ...

At the middle level, students are to focus on a theme of “change and migration” as follows:

A student shall demonstrate knowledge of the facts and sequences of historical events, the origins and shaping influences of various points of view, and historical events in relationship to themes of change and migration by:

- 1) analyzing historical events from the point of view of the participants;
- 2) illustrating a theme of change or migration that encompasses historical events ...

If this theme were spelled out more clearly, it might be an interesting way to focus students' learning. However, is this the only theme for all of the middle level years? Will they learn any history that does not revolve around the theme of change and migration? What kind of change are students to look at here? CBE's publication *Standards for Excellence in Education* has students understanding “long-term changes, enduring influences, and recurring patterns in world history” that include:

- major changes in world population;
- why humans have built cities and how the character, function, and number of cities has changed over time;
- major patterns of long-distance trade;
- how ideals and institutions of freedom, equality, justice, and citizenship have changed over time and from one society to another; and
- the development of nation-states; just to name a few.

It is not clear if there are specific topics intended in the Minnesota middle level standard or what exactly is meant by “change and migration.”

At the high school level, the content students are to study is merely outlined in a long, broadly worded list that includes “the American Revolution, expansion, the Civil War ... industrialization, the emergence of modern America ... and postwar United States to the present” all in one sentence. What students are expected to know about these events and time periods is not specified, nor is what they are to be able to do with that knowledge. In contrast, consider the following history standard (from CBE’s publication *Standards for Excellence in Education*, for high school) about the American Revolution.

11. Students will understand the causes of the American Revolution, the ideas and interests involved in forging the revolutionary movement, and the reasons for American victory.
 - a) The political, ideological, and economic causes of the American Revolution.
 - b) The principles expressed in the Declaration of Independence.
 - c) The factors affecting the course of the war and contributing to the American victory.

Consider also the following standard from the California history/social science standards, for eleventh grade:

- 11.1 Students analyze the significant events surrounding the founding of the nation and its attempts to realize the philosophy of government described in the Declaration of Independence, in terms of:
 - 1) The Enlightenment and the rise of democratic ideas as the context in which the nation was founded.
 - 2) The ideological origins of the American Revolution; the divinely-bestowed inalienable natural rights philosophy of the Founding Fathers and the debates surrounding the drafting and ratification of the Constitution; the addition of the Bill of Rights.
 - 3) The history of the Constitution after 1787 with emphasis on federal versus state authority and growing democratization.
 - 4) The effects of the Civil War and Reconstruction and of the industrial revolution, including demographic shifts and the emergence in the late 19th century of the United States as a world power.

Note the level of detail present in these two examples about what students are to know and understand about events such as the founding of the nation and the American Revolution. This kind of detail is lacking in the Profile. However, the level of detail is just one of the issues with the long list in part A of Themes of United States History:

- The items in the list are far from consistent. Consider the difference in specificity between “expansion” and “tribal sovereignty and the relationship between the American Indian tribal governments and federal and state government.” In fact, tribal sovereignty could be considered part of “expansion.”
- Some other items in the list are redundant. Why are “industrialization” and “the emergence of modern America” both listed? They are fundamentally inseparable in the study of U.S. History.
- This list also fails to mention some interesting subjects of great import such as the New Deal, World War I, the Progressive Movement, Populism, the labor movement, African Americans, women, conservation, immigration and nativism, the War of 1812, the Great Society, wars in

Korea and Vietnam, and the theories of American exceptionalism — the frontier thesis and the melting pot. Why were these excluded?

It should also be noted that nowhere in social studies does any statement refer to history outside the context of the U.S. It is important that students have the opportunity to explore history from a different perspective, and that they have a working knowledge of other societies and cultures from other times. Granted, world history is an option in Inquiry and Research, but its exclusion from social studies is a mystery.

To improve the high school standard for history, CBE and Achieve recommend expanding the standard to include a short list of what about the items listed in A students should know. For example, should they know the causes, course and consequences of the Civil War? This information could also be placed in a supplementary document.

The history skills in these sections also come up short. History skills are not content themselves; they are skills students gain as they work with the content. The national standards for history include a long list of skills student must develop as they interpret and analyze history. That list includes chronology, such as time lines and organizing history into periods; analyzing events from more than one perspective; identifying major changes and stable patterns; using primary and secondary sources; comparing competing historical narratives; formulating historical questions; and historical problem-solving; and these are just a few. Some of these are found in Inquiry and Research; however, many are still missing altogether.

In Minnesota, high school level historical skills are basically limited to statement B in Themes of United States History, “illustrate the influence of diverse beliefs on a theme or an event ... ” and Diverse Perspectives, where students evaluate actions and events from diverse perspectives. That this one skill is listed to the exclusion of all others is cause for concern and the reasoning behind this choice is unclear. This approach is insufficient unto itself and not well stated. Race, culture, gender and disability are not the only possible social categories by which to consider diversity. Class, religion, profession, age, educational attainment and geographical region are all other ways to look at diverse perspectives, yet this standard limits itself.

At the intermediate and middle levels, skills are also inadequately stated. They are hinted at: At the intermediate level, students use primary and secondary sources, look at cause and effect relationships, and use timelines. The standards containing these skills, however, are not clear, and those skills are thus not well defined. Events are to be studied “over an extended period of time.” Is that a century? A millennium? Or will six months suffice? Finally, what exactly does it mean to “describe a past event from the point of view of a local community member?” Can it be a past event of a few years ago? Or fifty years ago? Does the local community member have to be living or can referencing a primary source complete this task? What about describing an event through the perspective of more than one person who was there? Or can this requirement be achieved by interviewing a classmate? It is not clear which skills this particular statement is trying to address and therefore its important subject matter and relevance is difficult to determine.

At the middle level, students “analyze historical events from the point of view of participants.” However, there are many other skills students should be honing at the middle school level that are absent from this section, such as:

- distinguishing fact from opinion and historical facts and historical interpretations;
- analyzing cause-and-effect relationships and multiple causation;
- recognizing the importance of the individual and the role of chance or error in history;
- comparing and/or contrasting competing historical narratives; and
- recognizing that historical interpretations are subject to change.

Students will be ill-prepared for high school level history without developing these sorts of skills.

Some skills are present at the primary level as students learn about “family, school, and community.” They look at changes over time in statement F and G, and look at different interpretations in statement E about “how different people may respond differently to the same event.” However, the Profile should at least mention that students should learn about multiple causes and effects of historical events; an introduction to chronology, including distinguishing between past, present, and future time; differentiating between primary and secondary sources; and distinguishing fact from fiction, for example.

Other skills that might be used in history are present in the standards for Inquiry and Research. Reviewers found it confusing to have these separated out. Because so many important skills are missing, it might be worth considering adding an additional section(s) to the standards for history, outlining more clearly the historical skills students are expected to demonstrate beyond knowing the influence of diverse ideas on events or themes. Such sections should include the skills listed above. Minnesota should also consider combining the Diverse Perspectives standard and section B of the Themes of U.S. History standard and creating a new standard that covers a broader spectrum of history skills. Currently these two elements are redundant, and they could be revised to present a more balanced picture of historical skills students need to master.

Specificity and Clarity

In this case the issues of specificity and clarity are intertwined and often lead to some of the gaps listed in Important Subject Matter. Throughout the standards pertaining to history, there is a lack of specificity; and what is specified is generally not clear enough to be of much use.

At the high school level, the broad, lengthy list given in Themes of U.S. History provides no guidance as to what students are to know about the events listed. Additionally, the phrase, “illustrate the influence of diverse ideas or beliefs on a theme or an event in the historical development of the United States,” is confusing and unclear. “Ideas” do not influence “themes,” and it is unclear what is meant by “diverse ideas or beliefs.”

Similar broad language is found in the standard Diverse Perspectives. What “events and actions” are students to evaluate? Does this phrase intend to refer to U.S. events, world events or both?

Are these events current or historical, or both? And is each “event and action” meant to be evaluated by all of the categories of “race, culture, gender, and disability?”

Similar problems apply at the middle level in History and Citizenship. Students are to know the “facts and sequences of historical events;” but there is no indication of which events or how teachers are to discern which historical events. The use of the phrase “change and migration” could use elaboration as well.

At the intermediate level, clarity is weakened due to the confusing and repetitive sentence that begins:

A student shall demonstrate knowledge of historical events and contributions of key people from different time periods through reading and constructing timelines of key events and the actions of important people, the contributions of key historical people, and cause and effect relationships over an extended period of time to:

Note the repetition in the phrases: “contributions of key people,” “actions of important people,” and “contributions of key historical people,” as well as “historical events” and “key events.” The construction of the sentence is also difficult to understand: Students are to “demonstrate knowledge of” a set of things “through” a set of things “to” do a set of things. This further clouds any understanding of what students are to know and do. Moreover, as noted earlier, the phrases used are very broad. The standard begs the question of which “key people” and “historical events.”

For the most part, the language at the primary level (Family, School and Community) is clear; and the statements, while problematic due to the limited focus, are specific enough.

To remedy this lack of clarity, CBE and Achieve recommend that the state consider revising the standards, maintaining most of the original structure to include more specific information. For example, the five eras/topics listed in Themes of United States History could each be made into a separate statement, with additional detail describing what about those eras students are to know.

Rigor

Reviewers agreed that rigor is difficult to assess in the history sections of social studies, primarily due to a lack of clarity and specificity as to what students are to know and be able to do. When compared to outstanding standards documents such as national standards, NAEP frameworks, and standards from California, Virginia and Massachusetts, this document shows relatively little rigor. However, given more specificity about what is meant by the various statements, these standards could contain rigor. Consider the following intermediate level standard:

A student shall demonstrate knowledge of historical events and contributions of key people from different time periods through reading and constructing timelines of key events and the actions of important people, the contributions of key historical people, and cause and effect relationships over an extended period of time to:

- 2) reconstruct a historical account of an event using primary and secondary sources;

With clarification as to what sort of “key events,” “different time periods,” and “historical people” are meant by this statement, this could be quite a rigorous task. However, without such clarification, the standard is too broad to definitively determine the rigor.

Balance of Knowledge and Skills

Students study historical events from a wide variety of sources, and the process of studying those events both requires and develops skills that enable the student to research, comprehend, analyze, debate, and interpret those events. Frequently in the history sections of Social Studies, skills are intermingled with knowledge. For example, at the intermediate level (Historical Events) statements 1, 2, and 4 are thinking skills, while statement 3 seeks actual knowledge.

As noted in Important Subject Matter, content is drastically under-emphasized throughout. Many of the analytical tasks put to students are not linked with any specific content. For example, at the middle level, students are to:

demonstrate knowledge of the facts and sequencing of historical events, the origins and shaping influences of various points of view, and historical events in relationship to themes of change and migration by:

- 1) analyzing historical events from the point of view of the participants;
- 2) constructing a history of a local community, institution, or the role of individuals to illustrate a continuum of change.

This implies that students are working with historical content, but which events, influences, and topics are not mentioned – the act of analyzing from the point of view of participants and constructing a history of a local community are the focus. Without clarification of what content is to be studied, the skills have less value.

However, important skills are missing as well, as also noted earlier. The emphasis in the sections dealing with history seems to be on diverse perspectives (which is poorly executed), a theme of change and migration (which is unclear), and local/personal history, which is an uneven approach to balancing knowledge and skills. To better balance knowledge and skills in the standards pertaining to history, CBE and Achieve recommend the state consider, as mentioned earlier, supplementing the standards with additional skills and additional clarification on what content is to be studied.

Progression and Grade-by-Grade Development

Reviewers noted that there is a lack of progression between the intermediate level (Historical Events) and the middle level (History and Citizenship.) In fact, the intermediate level requirements almost could be considered more difficult than the middle level requirements. For example, at the intermediate level, students are asked to “demonstrate knowledge of historical

events and key historical people,” while at the middle level they are to “demonstrate knowledge of the facts and sequences of historical events,” which is not necessarily more sophisticated than the intermediate level.

Moreover, it should also be noted that since there are no specific content topics spelled out at the primary, intermediate or middle levels, there is little connection between the lower grades and high school. Most history standards considered to be high quality give a general outline for when content should be studied, and thus students are introduced to topics in earlier grades that they often have the chance to analyze in greater depth in the upper grades.

To remedy this gap in progression, the state could consider developing an outline of what historical content is to be studied at each grade level to serve as a supplement or addition to the Profile to better indicate how students’ historical knowledge will build on previous years. The standards also could be revised to be more specific about the ways in which students will interact with and analyze the history they are studying, such as asking students to compare and contrast, explain versus describe, draw conclusions about primary sources, and offer their own interpretations of historical events.

Measurability and Potential for Instruction

As with rigor, it is quite difficult to determine the measurability and potential for instruction in the standards pertaining to history given the lack of clarity and specificity. It was a source of concern for reviewers that there is so little information given, leaving teachers and curriculum developers at a loss as to how to interpret this document. The information given does not adequately prepare districts, schools and teachers for any kind of statewide or common assessment. The document provides no specification of what will be considered mastery or what about any given topic is important enough for students to be able to know. When students are asked to “demonstrate understanding of the Declaration of Independence,” is knowing the date of July 4, 1776 important? What about knowing the signers of this founding document? Will a vague knowledge that it included the phrase “life, liberty, and the pursuit of happiness” suffice, perhaps without any recognition of King George? Teachers could choose to focus on any combination of these and students may still not meet the standard, depending on how the state requires students to show mastery. As a result of the vague language and the lack of clarity and specificity, this document has little potential to support a system of curricula and assessments. In fact, reviewers said they would not relish the task of creating a curriculum to fit this document. Some verbs used in these sections also inhibit measurability. For example, “investigate,” found at the high school level in Diverse Perspectives, does not set a measurable standard. A measurable standard would define what students should know or be able to do as a result of their investigation.

Focus and Manageability

The level of focus varies widely in the sections pertaining to history. There is an obvious focus on U.S. history at the expense of world history. At the high school level the long, broad list in part A of the Themes of U.S. History standard is not focused and could be very unmanageable,

since it could be interpreted to mean everything or nothing. The middle level History and Citizenship standard attempts to focus on the theme of change and migration — a different level of focus. It should be noted, however, that a theme of change does not focus the curriculum very much, as just about any material about history could fit into a theme of change. Finally, the lack of specified history content in grades K–8 results in a lack of focus as well.

If Minnesota wants to focus only on U.S. history, and if a theme of change and migration is the only theme desired for middle school students, the state may want to consider explaining these decisions to teachers, parents, and the public in some sort of introduction. To improve the manageability of the standards, additional detail would provide needed guidance to teachers who may need something more than a broad list of topics that could be interpreted to mean everything or nothing.

Public Support

One reviewer noted that the excessive focus on “diverse perspectives” could become an issue due to its political tone. It is possible that the public could interpret the explicit instructions as leading to politicized instruction.

As other states have negotiated the rigors of standards-based reform, they have often learned, no matter what approach they took to standards-based reform, that the public tends to favor rigorous, specific standards rather than unclear ones. Parents want to know, for example, to what standards their children will be held accountable. The confusing language and layout of this document makes what is required of students very unclear throughout the sections pertaining to history, which could be troubling to parents who want to know exactly what is expected of their children.

CIVICS

The standards for civics are stronger than some of the other areas of social studies; they provide more specificity and clarity than do the standards for history or geography. However, these standards are still missing important content and skills, focus too exclusively on civics within the U.S. and do not adequately build civic knowledge from grade level to grade level. To remedy these issues, the state could consider expanding and/or revising some standards for clarity and specificity, collapsing others and improving the progression between grade levels.

The field of civics is found in several standards: U.S. Citizenship and Community Interaction at the high school level; Current Issue Analysis and History and Citizenship at the middle level; Geography and Citizenship at the intermediate level; and, to some extent, Family, School and Community at the primary level.

Important Subject Matter

In the United States Citizenship standard at the high school level, students study “the foundations, rights, and responsibilities of United States citizenship,” how the U.S. embodies a

democratic republic, the ways groups exercise power, the Constitution and the Bill of Rights, how citizens can affect public policy, and “observing, analyzing, and interacting with an actual or simulated governmental process.” In Community Interaction, students learn about “organizations and the communities the organizations serve” through community service and analyzing community issues. This touches on the civics concept of the responsibilities of citizens, but only tangentially.

Missing at the high school level are the following concepts:

- the roots of development of the U.S. system of government, including the writings of Locke, Montesquieu, Machiavelli, and ancient Greece and Rome
- a familiarity with the Federalist Papers
- the evolution of the U.S. Constitution through precedent, amendment and judicial review
- federalism and national–state relations
- an understanding of the three branches of government in the U.S.
- political parties
- the electoral process, including campaigns
- the role of the media
- majority rule
- any concept of civics outside the U.S, such as the relationship of the U.S. to other nations, an understanding of the way the world is organized politically, how the U.S. influences other nations; the ways nations interact, different philosophies and structures of other systems of government and their advantages and disadvantages
- analysis of different interpretations of the origins and significance of current and historical events and controversies
- an ability to develop and justify positions concerning current or historical actions and controversies using relevant evidence, reasons and criteria for judging the merits of alternatives.

At the middle level, students gain grounding in civics skills through Current Issue Analysis. This is one of the higher-quality sections in the Profile. It involves important analytical skills that will serve students well as citizens. One possible area of concern, however, is in statement 4, “describing responsibilities of citizens involved with the issues.” This statement is somewhat subjective, touching on advocacy, and implies that all current issues present a responsibility to citizens: a responsibility to get involved. It also purports to make students’ community activity and involvement part of graded work, which is something that should be left to local communities to determine. While it is worthwhile for Minnesota to make efforts to allow students to gain school credit for their activities outside the classroom, such activities can be difficult to incorporate into accountability systems because of difficulties in quality control. Rather, the state must help define what skills and/or knowledge students should reap from their experiences and assess them on those. Focusing directly on service is not always effective for statewide accountability.

Also at the middle level is History and Citizenship, which includes citizenship only in statement 4: “describing how citizens contribute to a changing community through participation.” This

fairly confusing statement is too vague to determine if it includes important subject matter. Citizens should be aware of the ways in which they can affect the political process and participate in their communities, but little information is provided on these topics. The topic is better handled in, for example, the New Hampshire social studies standards:

Students will demonstrate an understanding of the meaning, rights, and responsibilities of citizenship as well as the ability to apply their knowledge of the ideals, principles, organization, and operation of American government through the political process and citizen involvement ... Describe and analyze the ways Americans can effectively participate in civic and political life at the school, community, state, and national levels and discuss how such participation can lead to the attainment of both individual and public goals.

Students at this level should also be able to describe and compare past and present political figures, institutions and events, identifying relevant likenesses and differences, and conduct research into political events, ideas and institutions.

Little civic knowledge is found in grades K–5. Civics at the intermediate level is represented by Geography and Citizenship, which is poorly named as it includes little civics content and focuses instead on community — and in statement 4c, community involvement. Statements 4a and 4b are much more about geography. At the primary level, students receive even less grounding in civic knowledge. While it is understood that the early years of schooling should focus more on literacy and math skills, there are still important skills and knowledge that should be studied to give students a basis for later work in civics. At the very least, students encounter a small scale of civics in the classroom, where rules apply. Students should be able to discuss classroom rules and policies, as well as discuss and write about political events, activities and figures; identify major state, local and national figures and what makes them important; and distinguish between positions on an issue, identifying reasons for each and making a judgment about which one is better.

CBE and Achieve recommend maintaining the overall structure of the standards pertaining to civics, and the state might want to consider expanding some of the standards to include some of the missing important subject matter in more detail. The standard on United States Citizenship, for example, could be expanded (or one or two additional standards created) to provide adequate coverage of important topics, including the relationship of the U.S. to the rest of the world, political parties and the electoral process, and an analysis of the structure of U.S. government. Another possibility would be to combine Community Interactions with U.S. Citizenship, since Community Interactions really gets at ways citizens can participate.

Rigor

At the high school level, the rigor is inadequate. The structure of U.S. Citizenship has students demonstrate understanding by “examining” in some cases. This says little or nothing about how rigorous their demonstration of understanding must be. The rigor is better in statements C and D, where students are analyzing. “Analyze” implies that students are drawing conclusions about an issue, while “examining” need not have any clear result. It should also be noted, however, that

the missing content at the high school level renders this section less rigorous than comparable documents.

At the middle level, Current Issue Analysis is fairly rigorous, as students must identify a range of opinions, defend a position and present their findings. The statement in History and Citizenship, where students “describe how citizens contribute to a changing community,” is not particularly useful or specific. At the earlier grade levels, missing content compromises the rigor of those standards.

Revising the standards to be more specific about expectations and being clearer about the types of analysis students are to engage in would make the standards more rigorous, as would the addition of missing content. This revision should be considered by the state.

Balance of Knowledge and Skills

While many important skills and content are missing, what is present is generally well balanced and appropriate, in contrast to other standards in Social Studies. All sections pertaining to civics need to be fleshed out both in terms of content and skills — particularly in content; too much important knowledge is missing. The standard for Current Issue Analysis, however, does a fairly good job of balancing content — “the history, facts, controversy, values, beliefs, and emotions surrounding the issue” — with analytical skills, as students describe the range of opinions on the issue and select and defend a position.

Progression and Grade-by-Grade Development

In general, the material pertaining to civics at the intermediate and middle levels (as well as primary) is inadequate preparation for high school study. Few foundations are built, and few are built upon. For example, while the requirements of Current Issue Analysis are strong, students do not have the opportunity to build on those skills by engaging in more sophisticated analysis of issues at the high school level, with the exception of Issue Analysis in Inquiry and Research. Similar to the standards for history, students appear to have little or no exposure to an understanding of U.S. government at the grade levels preceding high school.

To remedy this issue, the state could consider revising the standards to carefully build on the skills and knowledge learned at one level at the next. Students could build on the skills developed in Current Issue Analysis by, for example, analyzing different interpretations of current issues or events or developing criteria by which to judge positions taken on current or historical issues. They do this to some extent in Issue Analysis in Inquiry and Research, but it is not clear why these two standards are in different learning areas.

Specificity

The statements pertaining to civics, such as Current Issue Analysis, are more specific than many of the others within social studies, as well as within the Profile. Still, more detail is needed to make this document more useful for teachers and students as the standard begs many a question.

What, for example, is important about the Constitution and the Bill of Rights (in United States Citizenship)? What sorts of ways that citizens affect public policy should students examine? What kind of activity in Geography and Citizenship qualifies as contributing to the improvement of the student's community? Moreover, in Current Issue Analysis, where students are to "select a position based on information," what kind of information? In this information age, not all information is equally substantiated, yet is more widely available than ever before. Students should really focus on "documented" information; or better still, research information, and identify its validity, assess its credibility and/or discern any bias. They should know what reliable sources of information are, and which sources are not so reliable.

Measurability and Potential for Instruction

The standards for civics show some strengths in measurability. At the high school level, for example, reviewers praised the connection between the stem sentence, which asks students to demonstrate understanding of the rights and responsibilities of citizens, how the U.S. embodies a democratic republic, and the structures of power, as well as the four statements A–D that follow. Students look at key documents, investigate issues surrounding individual rights, learn about the government process, and learn about the ways citizens can impact government. The standard as a whole sets out knowledge and angles to take in learning that knowledge, providing some insight on ways to measure attainment of this standard. The skills developed are directly linked to the content students are learning, which is significant, since in other subjects in the Profile, skills and content are listed in the same standard but not inherently linked to one another. This provides teachers and districts with more of a context on how a students' knowledge might be assessed. However, as mentioned earlier, in some cases the language relies on words such as "examine." To measure attainment of this goal, does one look for evidence of examination? What, exactly, does the state expect students to have learned in the process of that examination?

At the intermediate and middle levels, standards such as "participating in an activity that contributed to the improvement of the student's community" and "describing how citizens contribute to a changing community through participation" are too broad to assume consistency in instruction and achievement across school districts. The language of the standard does not provide an adequate description of what it might mean to meet the standard. How would we know that an activity had had a positive impact on community? Who is to judge?

Clarity

Clarity is a key issue in the standards for civics. In United States Citizenship, the stem sentence is far too long and confusing, particularly because far too much has been condensed into one run-on sentence:

A student shall demonstrate understanding of the foundations, rights, and responsibilities of United States citizenship, including how the United States government, as established by the Constitution, embodies the principles and ideals of a democratic republic; the rights and responsibilities of United States citizens, non-citizens, and dual citizens, and the formal and informal structures within which interest groups exercise power ...

First, this standard is really about more than just citizenship, yet tries to frame all topics within that approach. It is also repetitive — is it necessary to repeat the phrase about the rights and responsibilities of citizens? The state might want to consider editing this standard into two or more sentences that more clearly state what is expected of students.

For the most part, Current Issue Analysis at the high school level is clear and well stated. At the middle level, History and Citizenship (part 4) is too vague, with its main references to “historical events” with no detail.

Focus and Manageability

It would appear that there is a focus on citizenship within a U.S. context, which leaves behind a more global view of civics and the opportunity to analyze the structures and functions of government. Because the civics standards address only a portion of civics knowledge, the expectations outlined in it for civics knowledge are reasonably manageable, with the exception of language so vague as to confuse teachers and curriculum developers. To encourage a more comprehensive civics education in Minnesota, the state should consider revisions as well as additional standards or parts of standards, which could be added to provide coverage of other important topics and could do so without making the standards too long or unmanageable.

Public Support

Some of the facets of Current Issue Analysis have the potential to raise concerns with the public. Students may choose issues too controversial for their school or community, but this is not the fault of the Profile; still, the state and districts should be aware that controversy could arise if students engage in analysis of divisive or “hot” issues. This controversy is amplified by the implication that there are specific responsibilities to get involved with issues; in other states, this kind of standard has been problematic because some parents may feel that theirs and their students’ beliefs are fodder for meeting standards; that students must show allegiance to a set of political beliefs in order to meet certain requirements.

GEOGRAPHY

The standards pertaining to geography are uneven and lack rigor. As with most of the standards in social studies, they lack the clarity and specificity needed to clearly state rigorous expectations for all students. CBE and Achieve recommend the state consider revising the standards for geography for greater clarity and specificity and/or reorganizing some of the standards and elements of the standards to eliminate redundancies, improve clarity and fill gaps in content and skills.

At the high school level, students have the option of meeting the requirements of Human Geography. At each of the other levels, some geography is required by the state default — in Geography and Culture at the middle level, in Geography and Citizenship at the intermediate level, and in Family, School and Community at the primary level.

Important Subject Matter

The organization and focus of many of the standards result in gaps in important subject matter. At the high school level, the standards contained within Human Geography are flawed. First of all, this standard is not limited to human geography but also contains elements of physical geography, making it inconsistent with its own title. The organization of content within the statements is also problematic. The standard is as follows:

A student shall demonstrate understanding of human geography by:

- A) identifying the location of major places and features on the surface of the earth, the physical and cultural characteristics of places, the physical processes that shape pattern on the earth's surface, how movement of cultural characteristics interconnects various places, and how the physical environment is modified by and modifies human activities;
- B) interpreting and communicating geographic information through maps and other forms of graphic tools and geographic information systems;
- C) analyzing the effects of alterations on cultural landscapes, physical landscapes, or both;
- D) analyzing the relationship between geography and a dispute about land use versus ownership or political control; and
- E) analyzing the relationship between geography and culture.

This standard overall tends to overemphasize cultural geography. Additionally, Part A contains five of the Six Essential Elements from *Geography for Life: National Geography Standards 1994* along with some language reminiscent of *Guidelines for Geographic Education: Elementary and Secondary Schools* (1984). This attempt to condense the six essential elements into a single statement is unclear and obscures the meaning and purpose of the important subject matter of geography, as it does when attempted in history or civics. These elements might be better broken into separate parts of the standard. Part B, however, does well at capturing what *Geography for Life* refers to as the “geographic eye.” Parts C and E are duplicative and redundant, and merging the two is worth considering. Part D is inconsistent with the other elements of the standard. It is a fairly specific task, more of a research question: Students are asked to analyze the “relationship between geography and a dispute about land use versus ownership or political control,” and it is unclear as to why this type of research task was called for. The state might want to reconsider what the “big idea” behind this requirement is and revise the standard to make it less like a specific task.

At the primary level, geography is fairly well served in Family, School and Community. However, some important skills relating to geographic tools are insufficiently covered. At the intermediate level, part 1 is flawed in its reference to “people, places, and locations.” This mistakenly reflects language from *Geography for Life*, which reads “people, places, and environments.” This reflects a misunderstanding of the place and location relationship and loses the key idea of context. In *Geography for Life*, environment was meant to capture the idea of human and physical processes coming together in an environmental context — an idea that is lost in the Profile. The state might want to consider revising the phrasing of the standard to reflect this.

Rigor

In many instances, the standards pertaining to geography rely on the term “identify,” which indicates that students do not have to do very much to meet the standard. The lengthy sentence in Human Geography, part A, is the best example of this. Students also only need to “identify” and “describe” at the middle level, where more could be expected of them. The remaining statements in Human Geography utilize terms such as “analyzing” and “interpreting,” a significant improvement over “identify.” At the grade 6 in New Hampshire, by contrast, students are to:

- describe and compare housing and land use patterns in rural, urban, and suburban areas in the United States and other regions of the world;
- evaluate the effects of weather and climate on agricultural activities, types of housing, fuel consumption, and other activities in their community and state;
- describe, by examining the development of major industries in the United States, how geography and factors of production have contributed to the location of certain types of manufacturing in particular places and regions

Note the use of terms such as “describe,” “compare” and “evaluate.” Use of these terms, rather than terms such as “identify,” would make the geography standards more rigorous and imply a more comprehensive understanding of the content. Furthermore, there is sometimes not enough information to determine rigor. What is meant, for example, in Geography and Culture (middle level) by “describing the economic development?” Does it mean the economic history, or the economic characteristics? What about economic development is the student supposed to know? This lack of clarity, described more in Clarity, inhibits understanding of the document, including whether or not it is rigorous.

Balance of Knowledge and Skills

In general, the standards for geography are imbalanced — in favor of skills as opposed to content. Content, overall, needs to be stated more clearly, and missing elements, described in Important Subject Matter, need to be included to better balance the content and skills. At the middle level, for example, there is probably not enough on mapping skills or on the movements of peoples and cultures.

Progression and Grade-by-Grade Development

One issue with progression is in conjunction with the statements pertaining to history. Consider the following:

| <i>In statements pertaining to ...</i> | <i>Stem Statement reads: "Demonstrate knowledge of ... " at the following levels:</i> | <i>Stem Statement reads: "Demonstrate understanding of ... " at the following levels:</i> |
|--|---|---|
| Geography | Primary | Intermediate Middle High School |
| History | Primary Intermediate Middle | High School |

In short, history does not require “understanding” until high school, while geography requires it at the intermediate level and above. This kind of inconsistency reflects a lack of a well-thought-out articulation of a progression of skills.

There is also little progression of that knowledge between the intermediate and middle levels in the statements pertaining to geography. For example:

At the intermediate level, students:

demonstrate understanding of ... characteristics of world regions by: creating mental maps or graphic representations showing knowledge of location.

At the middle level, students:

demonstrate understanding of how the regions of the world are defined ... using mental maps to show location or region

It is not clear what the difference between these two statements might be, except that the intermediate level requires “other geographic representations” and the middle level, inexplicably, does not. Similarly, at the intermediate level students describe how resources and products are used in a region, and at the middle level they describe the economic development. In both cases, they are “describing” and the content is very similar.

There is also a gap in knowledge, as mentioned, about geographic tools. The intermediate level has “other geographic representations” and the high school level has “other forms of graphic tools and graphic information systems,” but there is no content at the middle level to bridge that gap.

These types of inconsistency in the progression between grade levels can and should be avoided. If possible, the state should consider revising or editing the standards for geography to correct these errors.

Specificity

The specificity of the statements pertaining to geography is uneven. Compare statement D from Human Geography (high school, listed earlier) with the other standards in that section. In D, students analyze “the relationship between geography and a dispute about land use versus ownership or political control ... ” whereas statement E, for example, has students analyzing “the

relationship between geography and culture.” The difference in specificity in these two statements is significant. Why is the idea of a dispute about land use, one tiny element of geography, pulled out and given its own statement, while “the relationship between geography and culture” remains so broadly phrased? In fact, many phrases in the sections pertaining to geography are too broad to be useful. Exactly what is expected of students is not clear. CBE and Achieve recommend that these standards be revisited with an eye to clarity and anticipating what teachers will need to know to lay out expectations for students.

Measurability and Potential for Instruction

As just mentioned, in many cases the requirements for geography are not specific or clear enough to be of use to teachers developing curricula. The uneven specificity contributes to this problem. See the following section on Clarity for more detail.

Clarity

Clarity, specificity, and measurability are all affected by the frequently broad and often uneven language of the standards. Confusion results from the wordy, lengthy sentences confounded by often vague language. The structure of the sections adds to the confusion, with students “demonstrating understanding Of ... By” in some situations, and “demonstrating understanding Of ... including an understanding Of ... ” in others. This structure of stem sentences and supporting statements is hard to read and follow, as is the uneven pattern of numbering the statements. Some are lettered, some are numbered, and some have both. The lettering/numbering of standards is easily remedied; the structure of sentences is more complicated and could be revisited.

Focus and Manageability

Geography is more focused and manageable than some of the other topics within social studies and within the Profile; however, in many cases, its vague language and confusing structure will make it difficult to manage. Students will not be overloaded by the few requirements that are clear. A more comprehensive knowledge is possible.

Public Support

There is strong public support for the study of geography in schools; however, that support is contingent on that study including place name knowledge. We hear so much about students not being able to place country *XYZ* on a map or knowing what hemisphere city *ABC* is in that the public often considers such knowledge to be measure of how well our schools are doing. This kind of knowledge is included—but not as clearly as it could be—in part because of lack of clarity or specificity regarding exactly what students should know and be able to do. Revisions, edits or supporting documents will help the public know exactly what is expected of their children.

OTHER

The remaining section is Institutions and Traditions in Society, an option at the high school level. This tends to fit into what is usually considered sociology. Reviewers had few comments on this section, and they are summarized below:

- Consider asking students to consider how institutions and traditions can strengthen or weaken a community; for example, how banks and churches can provide stability to a community, or how caste systems or practices such as Chinese foot binding limit a class of individuals, thus weakening the society.
- It would help to provide guidance on how this should be covered in school — history, geography, etc. Could be used in any of geography, history, civics, economics, literature and even arts and languages.
- Rigor is low with reliance on “identify” and “examine.” What is expected as a result of the examination?
- This standard is not really developed in any of the earlier grades — can it be introduced at the middle level?
- The standard would benefit from clarifying examples.
- The language and structure of this standard are fairly clear.
- The standard would be manageable if care is put into curriculum planning.
- Sociology generally includes other topics, but the choices made here are reasonable.

Institutions and Traditions in Society could be revisited. If an understanding of the underpinnings of sociology is intended, that should be clear, and some more concrete content included.

SUMMARY REVIEW

LEARNING AREA: INQUIRY AND RESEARCH

SUMMARY

The standards in Inquiry and Research do a nice job of emphasizing important skills. However, within this learning area and throughout the Profile, the content, in the context of which these important skills occur, is inadequately detailed, putting the skills of inquiry and research into a vacuum. Additionally, many of the standards in this learning area need clarification, and their organization as a series of performance tasks might make them difficult to implement.

One option for giving the skills in Inquiry and Research more context would be to consider placing them within their relevant learning area. Most of the skills listed at the high school level are correlated to a specific topic; by better aligning the skills to the content in which those skills will be learned, the standards will be clearer and more cohesive. Furthermore, the standards for this learning area would also benefit from editing wording for clarity.

INTRODUCTION

The Learning Area of Inquiry and Research is interdisciplinary and asks students to engage in various forms of research process and analysis on a wide variety of topics. At the high school level, students choose one standard to meet from each of two long lists of topics that include, among others, Math Research, History of the Arts, Issue Analysis, Research and Create a Business Plan, and Social Science Processes. At the middle, intermediate and primary levels, the topics are less organized around different topics and include Direct Observation, Accessing Information, Controlled Experiments and others.

The organization of the Inquiry and Research Learning Area lays out sets of skills that seem to exist outside of the relevant content. This organization implies that research and the whole process of inquiry are removed from the knowledge they seek to enhance. In the experiences of our experts, it is difficult for teachers to integrate such processes into curriculum when standards separate content from skills in this manner.

The separation of Inquiry and Research from the relevant content also renders the learning area more difficult to use in teaching. It is significant that many reviewers did not seem to know which areas of Inquiry and Research to comment on; and many neglected it, commenting only on areas within their immediate field. Imagine the response among elementary and secondary teachers. Secondary school teachers, in particular, are highly departmentalized and will need a great deal of support if Inquiry and Research is to be implemented at the high school level, including standards that are clear and specific enough. Frequently these standards are obscured by language so broad and vague that they could be taken to mean all possible content or very little content. Finally, the organization of this learning area as a set of discrete modules or

performance tasks causes them to exist outside the existing curriculum or existing systems in place in the schools.

There are some significant redundancies: In the second cluster of six high school statements, three — Research Process, Social Science Process and Case Study — are almost identical except for a few words. These might work better if combined. Research and Create a Business Plan and Market Research are very similar and could also be combined.

However, it should be noted that overall and despite the above problems, the statements in Inquiry and Research generally do a good job of balancing knowledge and skills, given its intent. In particular, it does encourage rigorous analysis and thinking skills, to the extent that those skills are clearly laid out. If integrated more thoroughly with the other learning areas, these standards would strengthen teaching and learning for all students and help them develop the kinds of skills they will need as Minnesota moves into the 21st century.

Because each statement within Inquiry and Research is so distinct from the others, the standards will be grouped roughly according to topic and discussed separately according to the criteria for high standards.

MATHEMATICS AND SCIENCE

This section includes the high school standards of Math Research and History of Science.

Math Research

In terms of clarity, specificity, potential for instruction, as well as focus and manageability, the Math Research option is a key example of how concepts are not explained clearly.

A student shall design and conduct an investigation on a mathematical topic by:

- A) selecting and refining a topic through research;
- B) formulating generalizations about the topic;
- C) documenting insights gained during the investigation;
- D) connecting new concepts to familiar ideas in mathematics;
- E) using mathematical properties to support conclusions; and
- F) communicating findings for an audience outside of mathematics.

The expectations for what skills and knowledge the student should reap from this investigation are not entirely clear. What does it mean to connect new concepts to familiar ideas? What kinds of investigations are intended by this standard? This lack of clarity, as is often the case in the Profile, leads to the possibility of wide variation in classroom implementation and diminished rigor. If a set of standards asks for tasks to be performed that are far from traditional, that document should be clear and specific about those tasks. Asking high school students to conduct research and communicate findings could mean many different things to many different teachers. Because this standards tries to encourage a fairly innovative approach, it is vital that what is

meant by that approach is abundantly clear so that teachers implementing it for the first time will have an accurate picture of what is expected.

There does not seem to be any doubt that the subject matter addressed in this section is of value, nor that, if implemented and taught well, valuable skills would be learned by students. However, the lack of clarity about what is expected renders this particular section weak.

History of Science

This fairly narrow standard certainly attempts to cover important subject matter. The expectation that students tie together the influences of society, economics, technology and the environment is an important one that is often overlooked in state standards.

Many reviewers took issue with the use of the idea of scientific breakthroughs as included in this section.

A student shall demonstrate understanding of the interaction between social, economic, technological, and environmental factors and the occurrence of varied major scientific advances in history by:

- A) gathering information on one major scientific breakthrough;
- B) investigating and analyzing the social, economic, technological, environmental context in which a scientific breakthrough occurred; and
- C) analyzing the immediate and long-term effect of the scientific breakthrough in any or all of the social, economic, technological, and environmental contexts.

For one thing, the student need only gather information on *one* scientific breakthrough, which conveys an inaccurate impression of the nature of scientific progress. What if, for instance, the scientific breakthrough that the student chooses to explore is something of an anomaly? This approach limits what can be done by way of comparison between or among breakthroughs and could lead students to the false conclusion that there is one way that breakthroughs occur and influence society. More important, as fulfillment of a requirement that addresses “the history of science,” looking at only one breakthrough seems to be an insufficient way to study the history of science. In fact, the use of the term “scientific breakthrough” is flawed. In the history of science, according to national science standards, virtually all of science is not a “breakthrough,” but the result of slow and continuous growth of understanding with little drama or abrupt breakthroughs. In this section, the connection between what is already known and what is discovered in the process is minimized. Research appears to be a process that stands alone, independent of the content in which it is embedded.

Furthermore, there are many other important skills relating to inquiry and science that are neglected here. Where do students study the underlying principles in science, such as the assumption that the universe is a vast single system in which the basic principles hold everywhere? Where do students learn about the ongoing nature of science — that just because a given theory fits all observations does not mean a new theory might fit even better; and the process of testing, revising and occasionally rejecting old theories never ends? When do students

learn to question scientific claims and arguments effectively? This important subject matter is neglected.

The requirements of this standard strike a balance in specificity that is interesting but possibly problematic. The standard is a fairly specific task, which can only be met by producing research on a scientific breakthrough. Yet the standard is broad and could encompass a great deal of content or very little. As a result, what this standard requires is largely left to individual interpretation and will vary greatly. This hinders this requirement’s measurability and potential for instruction as well as its manageability.

Regarding progression, this standard expects students to have an understanding of the interaction between economic, technological and environmental factors that influence the course of science. However, there is nothing in the statements for the earlier grades that would require teachers to lay the groundwork for students’ understanding of technological artifacts and systems — what needs and wants they respond to; the function of design, testing, feedback, troubleshooting and controls; and estimation of costs, risks and benefits. An understanding of the history of science is required for grades 6–8 and 9–12 in the American Academy for the Advancement of Science Benchmarks and for all grades in the National Science Education Standards of the National Research Council.

The History of Science standards do exhibit an appropriate balance of knowledge and skills. Students are expected to understand the content — the historical context of a scientific breakthrough — by using the inquiry skills of investigation and analysis, even if that content is not clearly defined.

To provide a more balanced picture of scientific inquiry at the high school level, this standard could be revised to include more than just a single scientific breakthrough and include some of the missing topics mentioned earlier. Additional standards could be added to encompass these ideas as well. This standard might also be more effective if edited to be clearer about what is expected of the student. For example, what research skills should the student learn in the process of “gathering information on one major scientific breakthrough?” Finally, it might be worth considering putting the requirements of this standard back into Scientific Concepts and Applications, so that the context of content is present.

SOCIAL STUDIES

This section includes History Through Culture, History of the Arts, World History and Cultures, Records of History and Issue Analysis.

History Through Culture

Reviewers noted that an introduction with an explanation some of the choices and strategies employed by the Profile of Learning is a serious omission. Why, in this standard, is the focus on “history through culture?” This raises questions about what is considered important subject matter. There are many lenses through which to study history, of which culture is only one.

Students could study history through economics, military action or politics. One would hope that students would investigate the cultural context of history in the course of completing any of the history standards, and it is not clear why culture is singled out for special attention here in Inquiry and Research.

Furthermore, the language and usage in this standard renders it unclear. The standard asks students to “demonstrate understanding of historical periods ... and leaders of a historical period, through investigating the cultural expressions of the period.” This is a confusing mix of the singular and plural, and could reasonably be interpreted to mean “if you study one period, that will suffice for an ‘understanding of historical periods.’” Similarly, “analyze” seems to be included without careful thought about its use. What is intended by saying students should “analyze ... architecture, technology”? The focus on the analysis is unclear. Again, what is expected of the student is not at all clear or specific.

Additional problems with clarity, measurability, potential for instruction and important subject matter can be noted when one observes that, by its very breadth, this statement seems to cover *all* important content. The standard says students should “understand historical periods, including major events, conflicts, and leaders of a historical period.” This standard encompasses a huge amount of potential content, and thus there is likely to be wide variation in how much of the important content of history is learned. The standard specifies that students should understand “major events, conflicts, and leaders,” and students are told to gather information about “artistic works, architecture, technology, and daily life and social customs,” and the context for study is “historical periods.” However, which periods, events and leaders is not clear.

The kind of analysis and interpretation expected here, and the number of fields that must be considered, appear to make the statement a rigorous one but again, the lack of specific content makes consistent implementation unlikely. As noted above, teachers will need to make choices about what will be taught and what they are looking for when they ask students to “analyze,” and those choices will vary from school to school and district to district, inevitably affecting the rigor of what students will know.

The state could remedy some of the issues with this standard by restating it within the context of history content. This could be done by placing it, as a skill standard of sorts, into People and Cultures; it could also be achieved by providing more concrete examples of what this sort of inquiry should look like within the standard.

History of the Arts

It is gratifying to see history of the arts emphasized through this standard. However, its optional nature raises the question of whether students who choose not to meet this standard are precluded from having access to the history of the arts in any substantial way, since this is the only mention of the history of the arts. Lacking this knowledge could affect a student’s ability to meet the arts standard set out in Arts and Literature.

The wording of the statement is challenging to decipher with any clarity. Multiple tasks and ideas are condensed into one sentence, resulting in confusion.

A student shall demonstrate understanding of an art form or theme from various historical periods or cultures and, for each work, gather information to analyze the development of a selected idea or theme; and select, describe, and interpret works of art in a historical, cultural, or historical and cultural framework; to identify changes, developments, or both, of:

- A) themes or ideas;
- B) social or cultural contexts;
- C) the form and function of each work, and;
- D) the expressive qualities of art for each historical period.

It takes several readings to make sense of this standard and determine what is expected. In addition, as in *History Through Culture*, it would be helpful to have an indication of which periods were most essential. However, overall this statement covers the important subject matter one would wish students to know about the history of the arts. It implies that students must understand the reciprocal influence of arts on society and addresses the major areas of inquiry in the arts. Since the statement asks for a complex understanding and analysis of artistic works and their context and influence, it can be considered fairly rigorous. However, the lack of specificity about artistic periods makes it hard to be sure that student work would be held to a high standard.

This statement contains a good balance of knowledge and skills. Students are not expected simply to know a history of the arts, but to think carefully and connectedly about it as well.

This standard might be easier to decipher if separated into several more clearly defined components, such as one dealing with the historical/cultural contexts of a work, and another dealing with the development of an idea or theme.

World History and Cultures

Though laden with good intent, this standard suffers from several difficulties. The standard reads:

A student shall

A) demonstrate understanding of key events, people, places, concepts, and themes in the historical development of one or more cultures by:

- 1) a survey of world history including early civilizations, classical traditions, major empires, expansions of exchange and encounter, intensified hemispheric interactions, and the first global age; the age of revolutions; and the twentieth century; or
- 2) a comprehensive, in-depth focus on a single culture, nation, movement, or time period ...

The standard's vague terms make it impossible to assess its rigor, although the expectations that students analyze cause-and-effect relationships and conduct an in-depth study of a culture indicate that, with greater specificity, this statement could be appropriately rigorous. With the caveat that it is hard to know just what content should be covered, this statement aims to expect

students to think analytically about the content, not simply to let it rest in their minds. There is thus a good balance of knowledge and skills.

However, the expectation that students study a survey of world history that includes the list given would seem to leave no stone unturned. Yet, it is so broad and unspecific that it will be of little guidance to teachers; and the implementation of it will vary widely. The vagueness of the language makes part of this standard difficult to measure, for example “students demonstrate understanding by ... a survey of world history.” Does merely taking a survey course suffice for demonstrating understanding? What this standard means by “demonstrate understanding” is left unclear.

This standard only gets at a part of the important subject matter of world history. A broad survey approach is only an option, and an option included outside the Learning Area of Social Studies. Students could also satisfy the requirement through an in-depth look at only one nation, culture, movement, or time period. Both a wide knowledge of world history and an in-depth study of selected ideas are needed for a high school student to be well prepared for citizenship and higher education. Elements B and C, which ask students to investigate cause and effect relationships and “investigate the impact of [a] theme on other cultures, nations, movements, or time periods” are also too limited in their expectations. Finally, why was this topic included in Inquiry and Research rather than Social Studies? The statements are more about social studies than they are about the research process or the process of inquiry.

Regarding clarity, “themes” do not have “impacts;” the events examined here as part of a “theme” do. Also, “the impact of one theme on other cultures” could use some examples to illustrate what is meant.

It might make more sense to include this standard in Social Studies rather than Inquiry and Research, for the reasons mentioned above. For reasons of content and consistency, CBE and Achieve also recommend the state consider developing at least a rough framework for which world history is the most important for students to know and incorporating that into the standard or into a supplementary document.

Recorders of History

This is one of the stronger standards for Inquiry and Research. It gets at the key historical skill of using and interpreting historical resources, and is thorough, academic and specific in its expectations. It asks students to be thoughtful about primary and secondary sources and the authors of each. In terms of clarity, the wording in the main body of the statement is a bit garbled and drifts off course:

... understand that historical knowledge is the result of decisions made by recorders of history, including an understanding of events in a chronological framework, the factors influencing decisions made by recorders of history, and the types of information sources ...

Chronology is noted in the main body of the statement, but is not included in the specific descriptions of how students will demonstrate accomplishment of the requirement — a minor point, and easily remedied. Though elements A and B (which ask students to look at multiple accounts of the same event and develop their own record of an event using primary sources) are fairly curricular in that they specify a particular task, and the tasks are challenging and rigorous. This is a skill-based rather than content-based requirement and thus has an appropriate balance of knowledge and skills given its intent. It is written in measurable terms, and in a way that has potential for instruction.

The primary concern is why this particular historical skill was included in Inquiry and Research, and so many other important historical skills were left out of the Profile altogether. Furthermore, since this skill is so specific to history, it might work just as well to have it in the Social Studies Learning Area rather than Inquiry and Research.

Issue Analysis

This statement lays out an important civics skill and thoroughly covers important content. The lettered elements of this statement, especially E (identifying areas of conflict or agreement among various groups surrounding an issue), are rigorous. The requirement would be stronger, however, if students not only were to evaluate proposed solutions to issues, but also to propose and justify solutions of their own. The standard is appropriately specific, written in measurable terms, and in a way that would have potential for instruction. It is weighted toward skills, which is appropriate given its intent. It still guides students toward deep content knowledge and is comparable to national standards, so the balance of knowledge and skills is appropriate.

However, Inquiry and Research includes only limited skills related to civics and social studies in general. Students do not seem to get the opportunity to engage in analysis of the structures and functions of government; most history skills are omitted and geography skills do not seem to be well represented in this learning area.

RESEARCH AND INQUIRY

This section includes Research Process and Social Science Processes as well as the primary, middle, and intermediate requirements.

Research Process and Social Science Processes

As was noted under History of Science, the major weakness with the science-related INQUIRY AND RESEARCH standards overall is their lack of specificity and repeated use of vague language. Both standards provide a framework for engaging in research, but it is not clear what the outcome of the research should be or the context in which it should take place. Without content to provide context, they are both fairly unclear, and successful attainment of these standards would be hard to measure. However, the language used is clear.

These two standards appear to be largely redundant in purpose and content, for they contain much of the same material. They should either be more clearly differentiated into science-related inquiry and social studies/humanities inquiry, or else combined. They are essentially an abbreviated and unnecessary repetition of the detailed processes of science included in Scientific Concepts and Applications. Despite that, the prefacing statement does not apply to laboratory research. For nonscience subjects, however, these statements generally cover the relevant important content. However, since the decision of which standards students must meet is left to districts, it is quite possible that a student would not develop an in-depth understanding of the content studied, but instead would acquire fragmented bits of knowledge and skills scattered across social studies.

Regarding balance of knowledge and skills, these statements are heavily but appropriately weighted towards the development of skills, given their nature and intent. There are few specific facts, ideas and terms for students to master. Yet the skill requirements in element F (“discuss research findings, describe research problems, presenting primary data, formulating possibilities for further research”) in each make them rigorous statements.

PRIMARY, INTERMEDIATE AND MIDDLE LEVEL REQUIREMENTS

These standards focus exclusively on some aspect of inquiry and research, but no content is provided, leaving the science-, math-, and social studies-related standards without foundation. Some knowledge of world history, cultural history and history of the arts should all be expected of students before they reach high school. While each level is clearly related to the others and more skills are expected as students grow older, those skills do not necessarily increase in sophistication as students advance.

(Primary Level) Data Categorization, Classification, and Recording

This standard has students gathering, categorizing, classifying and recording information, particularly to answer a question. The standard is interdisciplinary; it could be applied in a number of different academic contexts. The statement mentions gathering information from direct observation and experiments but nothing about designing or setting up the experiment. It is unclear to what extent the student is responsible for that aspect of the standard.

Important subject matter related to development of early research skills appears to be well covered. However, while categorization of gathered information is mentioned in the stem or first part of the standard, it doesn't seem to be covered as well in the lettered elements that follow; and the statement is written fairly broadly so that it is hard to ascertain if there is truly an expectation to cover all relevant aspects of this skill.

This standard, however, is insufficiently specific. Students are to “gather information ... to answer a question” but it is not clear that the information should be focused and appropriate, or that students need to be able to ascertain how much is enough information. Students need to be able to record the information, but what sort of recording is intended here? Quick notes for

personal use? Notes that could be used to test and replicate research? Should a variety of media be used or is one type sufficient? How effective and complete does the student’s explanation of the answer to the question need to be? As a result, it is difficult to tell how rigorous this statement is, rendering achievement of the statement difficult to measure in a consistent manner from student to student; and therefore it has less potential for instruction. The state might want to consider clarifying the requirements of the standard through more specific language.

(Intermediate Level) Media, Observation and Investigation

This standard, another of the stronger standards in Inquiry and Research, lists several ways students would answer a question by gathering information, including direct observations, experiments, interviews and media sources. It includes some abilities that would be found in science, but also skills that might be utilized in social studies. The thoroughness of the statement as a whole, particularly the requirements under bullet C, makes this a rigorous statement. This requirement is fairly specific about the components of the observation and investigation skills that students must demonstrate.

A student would need to know content — the many steps for conducting and reporting on good observation and investigation — to master the skills themselves. Thus, the balance of knowledge and skills is a good one. However, reviewers noted that the activities described are fairly specific and leave less flexibility for classroom teachers than might be desired. Because this requirement is more specific than those typically found in Inquiry and Research, it would be a straightforward matter to measure a student’s achievement of its components.

However, by trying to include so many possible different kinds of inquiry in one standard, it loses some of its effectiveness. It also fails to include the important steps of designing investigations and comparing the results to accepted scientific explanations. It makes no reference to how the inquiry is related to what the student already knows and what is learned by the inquiry/investigation. The focus of the statement does not seem to warrant inclusion of “media” in its name. Media is simply one of the categories of resources for observation and investigation. “Observation” and “investigation” describe an action; “media” describes the object of the action.

However, the wording is a bit garbled. It suffers from the same problem as many of the others: Too much is crammed into what is, in effect, a single long sentence of many interconnected parts — and clarity suffers.

(Middle Level) Direct Observation, Accessing Information, Controlled Experiments:

These three standards describe three ways students are to engage in research to answer a question. The essential content of these statements is covered. However, as in the Data Categorization standard in the primary level, they are written in such broad terms that they could in fact cover everything or almost nothing. They lack sufficient specificity to ensure that they can be equitably taught and measured.

The standards need some work to be clear and understandable. Direct Observation, for example, asks students to gather information through two kinds of direct observation, but the real difference between these two is not clear enough, and the organization of different activities and skills is somewhat illogical. Under Controlled Experiments, the language is fairly clear, but it would help to know if students are to design the experiment they will conduct.

The statement on Accessing Information is too vaguely worded to be measurable. No indicators are given that would enable assessors to help determine whether a student has correctly learned how to record and organize information — no opportunities are present for students to demonstrate their knowledge. For the same reason, it is difficult to tell how rigorous the expectations for students are. They spell out a reasonably complete picture of the skills students need to exhibit, but those skills are described so broadly that it is difficult to assess their rigor. For instance, in Controlled Experiments, are students to design as well as conduct an experiment? The difference is significant in terms of rigor.

BUSINESS/MARKETING

Research and Create a Business Plan

The standards related to business and marketing are among the stronger Inquiry and Research standards. This high school standard contains content that is generally agreed to be the core knowledge in the area of business education. It sets a good level of rigor for the student; the standard is complete and will require students to use and research a variety of databases to develop their plan — and develop a complete business plan as a result. The mastery of important facts and ideas is well balanced with practical skills of research and presentation. It appears only at the high school level, so progression cannot be commented upon. It is specific enough to provide some guidance about what students will need to be able to do, although it is basically a performance task. The standard is specific enough to be measurable and does paint a picture of what is expected of the student. It is written in clear language that should communicate to the public what is generally expected from the student.

Market Research

This high school standard covers the general content of a market research project. It does not have the same rigor as the standard for creating a business plan, as it leaves the product, the manner in which the students report the research and content of the report open for interpretation. The rigor could come from the analysis of the data and from synthesizing it into a report to be shared with a specific audience. It is the synthesis of the data that will require higher-level thinking.

However, what is unclear is how the student's research will be reported. Is this to be left to the teacher and student to determine? Examples or indicators of the reporting expected should be given. Such a report should contain identification of the problem, research methods, results and recommendations. The lack of detail on this means that the rigor of student work could vary significantly from school to school and still be considered to meet the standard. The standard

should also make it clear that the marketing problem should be identified based on research. Since this standard appears only at the high school level, progression cannot be commented upon. The statement is not really measurable in its current form, although its language is clear and it should find good public support.

Note: None of the expert reviewers commented on the requirements of Case Study or Product Development.

SUMMARY REVIEW

LEARNING AREA: WORLD LANGUAGES

SUMMARY

The standards for World Languages are weak: They are too brief, too vague and do not set much by the way of expectations for student learning. While some of the main components of world languages standards are present, they would need to be significantly built upon to serve as high standards. Additionally, the state might want to consider expanding the focus on communication to include more of the context for the study of world languages in any revisions.

INTRODUCTION

The standards for World Languages are brief and broad. Throughout the grade levels, student are to show they can communicate in another language in a variety of ways, including both written and oral, and show some understanding of the culture of that language.

The reviewers for the World Languages standards agree that these standards are weak and do not effectively set high expectations for learning world languages. The standards are so vague that they can be of little help in encouraging students towards rigorous learning, much less help in shaping curriculum or assessments. While an effort has been made to establish rigor and clarity through adjectives such as “complex” and “highly skilled,” these terms are too subjective and do not contribute to rigor or clarity.

No standards for world languages are required by the state default (the standards that were required prior to May 2000. Ample research exists to show that students who study a foreign language tend to function better in school in other subject areas as well. Further, it is of concern to CBE and Achieve that Minnesota students have little exposure to languages and cultures outside the U.S. — a rather constricted view of the world in this global age that could well leave Minnesota students at a disadvantage.

REVIEW BY CRITERIA

Important Subject Matter

Nearly the entire focus of the standards is on communication (only one of the five national goal areas) and at that, the standards are not clear about how well students must communicate, whether they must listen and read as well as speak and write and what the context and in general terms) the content of communication should be. A good framework for communicating would provide a statement of the purposes for communication, which would allow teachers to focus their instructional goals. Culture receives some attention in these standards as well, but it is insufficient compared to examples of quality world languages standards.

In contrast, the standards for Florida have five areas of focus: Communications, Culture, Connections, Comparisons and Experiences. Similarly, the national standards have five almost parallel areas:

1. Communication: Communicate in languages other than English
2. Cultures: Gain knowledge and understanding of other cultures
3. Connections: Connect with other disciplines and acquire information
4. Comparisons: Develop insight into the nature of language and culture
5. Communities: Participate in multilingual communities at home and around the world

These five areas give students the opportunity to go much more into depth in their language studies. To only ask students to communicate without providing the rich context of the other four areas denies them a valuable experience. The Minnesota standards also lack reference to the study of literary works of other languages, a topic woven throughout the examples given here.

Rigor and Balance of Knowledge and Skills

The absence of key subject matter diminishes the standards' rigor. There is insufficient evidence of increasing sophistication from grade level to grade level, as noted below, and the vagueness of the expectations for the subject matter that does get included diminishes rigor still further. For example, the standards rely on terms, such as "complex" or "based on criteria," that remain undefined and, as such, do not provide much guidance to teachers or students. The standards simply do not provide enough information to serve as rigorous expectations for student learning. Additionally, the standards contain very little content, and thus the balance of knowledge and skills is weighted too heavily to skills.

Clarity and Specificity

The standards in World Languages are far less specific than they should be. They also rely on terms that are not clear or defined. Throughout the Minnesota standards, clarity is also an issue because of terms that could have multiple meanings and should be clarified, such as "symbolic [language]" and "domestic [language]." The high school standard serves as an example of the general lack of clarity and specificity.

A student shall demonstrate understanding of the features and appropriate applications of a foreign, domestic, technical, or symbolic language other than English and communicate in a variety of applications by:

- A) Showing evidence of comprehension of complex information communicated by others in a language other than English;
- B) using the language to communicate complex information to others; and
- C) analyzing information and communication situations based on criteria used by others highly skilled in the language.

What does it mean to "understand the features" of a language? What features are intended here? This is just one of the many terms that go undefined in these standards, such as "complex information communicated by others" or "others highly skilled in the language."

Compare this standard with some of the standards for grade 12 from Standards for Foreign Language Learning, the national standards for world languages:

- Students discuss, orally or in writing, current or past events that are of significance in the target culture or that are being studied in another subject.
- Students share their analyses and personal reactions to expository and literary texts with peers and/or speakers of the target language.
- Students demonstrate an increasing understanding of the cultural nuances of meaning in written and spoken language as expressed by speakers of the target language in formal and informal settings.
- Students demonstrate an awareness that there are phrases and idioms that do not translate directly from one language to another.
- Students identify and analyze cultural perspectives as reflected in a variety of literary genres.

Note the variety of ways that students interact with the language they are studying and the level of sophistication they must show, such as analyzing cultural perspectives and nuances of meaning. Note also the level of specificity displayed in these standards.

As another comparison, consider the following standards for high school from Florida's Sunshine State Standards:

The student understands and interprets written and spoken language on a variety of topics ...

1. understands the main ideas and significant details of extended discussions, presentations, and feature programs on radio and television, in movies, and in other forms of media designed for use by native speakers.

3. reads authentic written materials and analyzes them orally or in writing (e.g., describes character, plot, personal reactions, and feelings.)

The student recognizes that languages have different patterns of communication and applies this knowledge to his or her own culture ...

3. recognizes how languages differ in the way they can be used to communicate similar ideas (e.g., through written, oral, or artistic expression.)

These standards, like the national standards, provide a wide array of interactions with the language and call on students to engage in a variety of analyses with and about the language.

Progression and Grade-by-Grade Development

While there is some evidence of increasing skill level moving up through the grade levels, it is generally insufficient. For example, while some attention is paid to culture in the study of languages at the primary, intermediate and middle levels, this knowledge is not built on at the high school level, resulting in a missed opportunity. Additionally, as a result of the many undefined terms (such as “complex” or “a variety of applications”) and the overall lack of specificity, progression and grade-by-grade development is hard to track. By contrast, increased specificity in the national standards provides for clear progression in skills through the grade levels. At grade 4, students “share likes and dislikes with each other,” at grade 8, they “exchange information about personal events, memorable experiences, and other school subjects with peers

and/or members of target cultures,” and at grade 12, students “exchange, support, and discuss their opinions and individual perspectives.”

Measurability and Potential for Instruction; Focus and Manageability

The lack of clarity, specificity or evidence of increasing sophistication from grade level to grade level provides little basis for measuring student knowledge and performance or for developing consistently coherent and rigorous plans of instruction across the state. The standards are certainly not so copious in number or difficult in nature that they can be termed unfocused or unmanageable; but that is not so much a positive statement as it is a comment on the nearly complete lack of content in these standards.

SUMMARY REVIEW

LEARNING AREA: ARTS AND LITERATURE

SUMMARY

While more rigorous than some of the other learning areas in the Profile of Learning, the standards for Arts and Literature are too vague and unspecific. Also, these standards either omit important content and skills or contain gaps in knowledge, such that students are asked to learn without sufficient foundation, or do not build on what they have learned in previous grades. Additionally, the content in Arts and Literature is organized in a somewhat confusing manner. It is unclear why one component of literature was selected for inclusion in this learning area as opposed to Write and Speak or Read, Listen, and View, and why art history was selected for inclusion in Inquiry and Research rather than in this section. CBE and Achieve recommend that the state consider editing or revising the standards to include important details about what is expected of students; such a revision might also include an introduction or supplementary document explaining why the content is organized as it is.

INTRODUCTION

Arts and Literature combines literary analysis with arts interpretation and performance. The literature element is found only at the high school level; the arts dominate the other three levels. At the high school level, students must “demonstrate the ability to both interpret and evaluate complex works of literature,” as well as show understanding of the elements, techniques and processes of an art form and create and/or perform an original artistic presentation. At the middle, intermediate and primary levels, students learn about and demonstrate various skills in dance, visual art, music, and theater.

There are frequently gaps in knowledge and skills through the progression of the document, as is apparent in Balance of Knowledge and Skills and Progression and Grade-by-Grade Development. The document should be reviewed with an eye to this issue to make sure students are not asked to show knowledge of, for example, history of the arts in Arts and Literature, when the only previous or concurrent exposure to that knowledge is optional and is found within Inquiry and Research.

REVIEW BY CRITERIA

Rigor

One strength of the standards in Arts and Literature is the relatively solid level of rigor present in the standards. While all the standards are not clear enough to analyze, the standards that present clear expectations do so in a way that contains more higher order thinking skills, more applications of knowledge and more analysis. Whenever students are asked to express or communicate an idea in a visual or physical form, higher level thinking skills are involved, as the

degree of sophistication required by this mental translation is considerable. Students are asked to create or perform works of art, for example.

However, some of the standards reflect less rigor due to missing detail. As noted below, to “sing in a group” is not a rigorous expectation, but to “sing independently, on pitch and in rhythm, with appropriate timbre, diction, and posture, and maintain a steady tempo; sing expressively, with appropriate dynamics, phrasing, interpretation” is certainly rigorous. Adding detail to the standards can help make them more rigorous. Right now, many of the standards are simply a modestly complete list of fairly basic expectations.

Important Subject Matter and Specificity

There was some confusion among reviewers about the integration of arts and literature; the literature analysis more closely parallels skills found in nonfiction analysis (in Read, Listen, and View) and thus might be better suited to that learning area. Furthermore, the literature analysis does not mesh well with the rest of the standards, and in fact, all the other standards in this learning area focus on the arts, with only one high school standard referencing literature. The state might want to consider revisiting this choice to avoid confusion and present a more cohesive set of standards.

That said, these standards address many important elements of arts as well as literature. However, as in the other learning areas, there is important subject matter missing.

- In theater: script writing, producing, directing, media literacy;
- In dance: choreography;
- Across the arts: critical evaluation of students’ own and others’ creations and performances (primary and intermediate); explicit requirement to know technical and expressive elements of art form, such as descriptive vocabulary and important concepts about each art form (intermediate); and
- In literary analysis: important details in literary analysis, such as analyzing and tracing an author’s use of time and sequence such as foreshadowing and flashbacks; aesthetic qualities of literature, such as stylistic choices, choice of words and imagery in creating tone and moods.

Additionally, in many cases, the phrasing of the statements in Arts and Literature is so broad that it could be considered quite thorough or merely brushing the surface of the discipline. For example, at the high school level, in the requirements for Literature and arts analysis and interpretation, the way the statement is written to include both arts and literature makes it vague. What does it mean to “interpret and evaluate complex works of literature” by “describing how particular effects are produced by the artist’s use of the elements of the art form?” A good set of standards should be delineating some of the topics listed above such as tone, stylistic choices and imagery. As a result, important components of literary analysis are unclear or omitted. This problem could be remedied by including additional detail about what is expected of students.

This broad language weakens the arts elements as well. Some examples from *National Standards for Arts Education* juxtaposed to the relevant statements from Arts and Literature illustrate the importance of what is not said:

| Discipline | Minnesota standard (Primary) | <i>National Standards for Arts Education (K–4)</i> |
|--------------------|--|--|
| Dance | Demonstrate basic movements in musical or rhythmic contexts | Accurately demonstrate non-locomotor/axial movements (such as bend, twist, stretch, swing); accurately demonstrate eight basic locomotor movements; demonstrate accuracy in moving to a beat and responding to changes in tempo; demonstrate kinesthetic awareness, concentration, and focus in performing movement skills; create shapes at low, middle, and high levels; demonstrate the ability to define and maintain personal space; demonstrate movements in straight and curved pathways; attentively observe and accurately describe the action (such as skip, gallop) and movement elements (such as levels, directions) in a brief movement study. |
| Music | Sing in a group | Sing independently, on pitch and in rhythm, with appropriate timbre, diction, and posture, and maintain a steady tempo; sing expressively, with appropriate dynamics, phrasing, interpretation |
| Theatre | Use movement, sound, and language to create images, express emotions, and imitate animals | imagine and clearly describe characters, their relationships, and their environments; use variations of locomotor and non-locomotor movement and vocal pitch, tempo, and tone for different characters; assume roles that exhibit concentration and contribute to the action of classroom dramatizations based on personal experience and heritage, imagination, literature, and history |
| Visual arts | Use appropriate tools and processes of at least three different media to communicate ideas | Know the differences between materials, techniques, and processes; describe how different materials, techniques and processes cause different responses; use different media, techniques, and processes to communicate ideas, experiences, and stories |

The national standards provide much more detail about what is expected of the student and thus provide a more comprehensive set of expectations for study of the arts. The Minnesota standards, by contrast, constantly beg the question: When the standard states that students must “demonstrate basic movements,” readers are obliged to ask the question of what movements, what kind of contexts and what ways must students demonstrate movements.

Balance of Knowledge and Skills

There is a focus on skills in the early grades — to the detriment of important knowledge about the arts — which would result in inadequate preparation for analytical thinking in the later grades. Students at the early grades, as mentioned in Important Subject Matter and Specificity,

should have knowledge of standard descriptive vocabulary and concepts in each art form at the intermediate level.

Additionally, any history of the arts is contained in optional standards in Inquiry and Research — History of the Arts and History through Culture. This placement means that it is quite possible that students who do not choose those options are precluded from having access to history of the arts in a substantial way, as it is not mentioned anywhere else in Arts and Literature. In other words, if students are to meet the requirements of Literature and the Arts analysis, they will have to have knowledge of history of the arts; but that knowledge is not required anywhere in the Profile. The History of the Arts standard might be better located in the Learning Area of Arts and Literature, an option the state might consider.

Progression and Grade-by-Grade Development

Progression between grade levels varies significantly. There is generally a good progression from primary to intermediate. However, in many cases (and mostly due to the presence of vague language), the middle level standards appear to be a step backwards from intermediate. For example, at the intermediate level in visual arts, students, among other things, must “demonstrate the ability to communicate ideas effectively though at least three different media and techniques.” At the middle level, students must demonstrate fundamental skills, use improvisation to communicate artistic intent and create some original works. There is no mention of how many media and techniques, and no mention of communicating effectively. Another gap is revealed in music: At the intermediate level there is no mention of the variety of musical literature students are to encounter. The standard does not seem to adequately prepare students for the “variety of art works, performances, or presentations” they must interpret at the middle level. These issues of progression could be remedied through editing for increasing sophistication and with an eye to building on previous skills.

Measurability and Potential for Instruction / Focus and Manageability

Many features of the statements for Arts and Literature could render them difficult to measure. For example, many different types of performances are referenced. Any standard could be met in a myriad of ways, making it difficult to score and compare student work and schools’ progress. To use the example “sing in a group” again: that statement is certainly measurable and observable, but is simply singing enough? What is it about students’ singing that you want to know? What elements of performance need to be present to constitute a performance that meets some kind of standard?

In addition, if information about proficient levels of achievement is not included in the Profile, it should be detailed elsewhere. The state should also provide information about evidence and student work to give teachers a more concrete idea of what “meeting the standard” looks like.

These issues might affect the manageability of the standards. The standards are frequently so broad that they provide little guidance to teachers or others developing curriculum, which could make the standards seem overwhelming and unmanageable.

Clarity

In particular, the high school level standards are organized in a manner that makes them seem more complex than they are. The long sentences preceding the lettered statements would be clearer if they were broken into two sentences. Throughout Arts and Literature, statements are not parallel: Some use letters, some use numbers; some statements are in the present tense (“sing in a group,” “use movement, sound, and language,”) others are in present progressive (“communicating an informed interpretation,” “using improvisation,”) and still others use different subjects (“demonstrates”). For clarity, it is important to keep tenses, verbs and subjects consistent.

Additionally, some of the language in the primary statements is confusing. What is meant by “create images” in theater? Or to use “elements of environment?” Statements such as these are not clear and need to be defined and clarified.

Public Support

This document could be made more accessible by improving the format and layout to be more readable and consistent and by adding a glossary. This learning area would also benefit from an opening statement or introduction that spells out the arguments for why the arts are important for all students and why the document is set up the way it is.

SUMMARY REVIEW

LEARNING AREA: PHYSICAL EDUCATION AND LIFETIME FITNESS*

SUMMARY

The quality of the standards in Physical Education and Lifetime Fitness is mixed. The reviewers found this learning area to be deficient in many areas. Many components lacked the necessary specificity to make the document useful to teachers and students; many topics deemed important to the learning of each subject area were found to be missing or inadequately articulated; and the rigor in the standards was noticeably lower than that found in the corresponding national standards. In general, the standards for health were missing some important topics and generally too vague. Physical education, while comprehensive, was found to be lacking in specificity, rigor and grade-by-grade progression. Moreover, the standards for career education, while praised for having an option for middle school students, were not specific enough as well as not comprehensive enough. All the standards could be improved with increased specificity.

INTRODUCTION

Physical Education and Lifetime Fitness covers three distinct topics or subject areas: Health, Physical Education and Career Education. Students only meet requirements for Career Education at the middle and high school levels; they have Health and Physical Education at all levels. This area was previously entitled Decision Making; however, the standards were not so much about decision making as a whole as they were about these three specific kinds of decisions. Additionally, they are not so much standards of what students should know and be able to do as they are descriptions of activities with little indication of what knowledge or skills students should have.

The summary review that follows addresses the three topic areas separately.

HEALTH

Important Subject Matter

At the high school level, the standard for Individual and Community Health is missing some important subject matter, including mental and emotional health, body systems, assessing health information, healthy behaviors, and goal setting and decision making. For more information on these topics, standards 2, 5 and 8 of the National Health Education Standards should prove helpful. Moving down through the grades, there is less alignment with the national document.

* The new title for what was previously Decision Making is used in this review. However, Decision Making included career education, which is outside the realm of physical education and lifetime fitness. It may be that the career education standards will be moved to the new Learning Area of Technical and Vocational Education.

The list of topics in the first part of middle Level Personal Health includes the bulk of important concepts, while the intermediate standards move to a focus on decision making models at the expense of other important skills. At the primary level, the requirement is far more simplistic than the national document, but still gets at most important topics.

The middle level standards are the most comprehensive; there are many important topics listed — from nutrition to drugs and alcohol to safety — as well as a variety of ways students interact with the material. This is significant since it is at this age when students are the most likely to begin to engage in risky behavior.

Clarity and Specificity

The reviewers were mixed on the clarity and specificity of the standards. The standards about health are certainly broad enough to allow teachers to develop their own curriculum. Topics for study are listed fairly clearly, but exactly what it is students are to know about these topics could be described more clearly. In terms of clarity, as noted, expectations for students are not clearly articulated. For example, what are students to know about the “basic structures and functions of the human body,” as required at the middle level? Should students be able to name some different body systems or should they be able to describe each in detail?

Additionally, some jargon and technical language is present and could inhibit understanding of the document. What does it mean for a middle school student to “apply a decision making process to analyze health issues and attain personal goals?” By contrast, the national education standards have students demonstrate the ability to use goal setting and decision making skills to enhance health.

1. demonstrate the ability to apply a decision making process to health issues and problems individually and collaboratively.
2. analyze how individuals, family, and community values influence health-related decisions.
3. predict how consequences regarding health behaviors have consequences for self and others

This set of standards is much more comprehensive and goes into more detail about what is important about decision making processes. The standards cover more content by addressing how health decisions are influenced, and more skills by having students predict and analyze.

Focus and Manageability

The lack of clarity and specificity affects the focus and manageability of these standards. Because they are so broad, these standards could be implemented in a variety of ways; one teacher might go very in-depth and cover many topics in order to meet the standard, making it less manageable and less focused. Another might brush the surface of the material or cover only a few topics in-depth and still be able to say her students also have met the standard in a more focused, more manageable way.

The focus on application, specifically decision making, and process may well result in superficial treatment of very complex and important issues. This focus also reflects a lack of balance of knowledge and skills.

Rigor and Progression and Grade-by-Grade Development

The rigor of this section is mixed. While the often long lists of topics and requirements to create plans for study of individual and community health would seem to denote rigor, the lack of specificity in the standards leaves room for a great deal of variety in student achievement. It is possible to say that a student might meet the standard with work that would not reflect any depth of understanding of preventative health issues, for example.

Rigor is also weakened by the lack of increasing sophistication as the standards increase in grade level. For example, there is redundancy across some of the grade levels without much distinction in the level of complexity. Additionally, there is not always evidence of appropriate foundation for knowledge. For example, most of the standards for health at the intermediate level focus on using a decision making model; but the idea of such a model is not well defined nor is it introduced at a lower level. Finally, it is difficult to evaluate whether increased sophistication of conceptual understanding will occur when process and application are the primary requirements of the standards.

Measurability and Potential for Instruction

Since, for the most part, they are framed as activities and tasks, the health requirements of the Profile are more easily measured than the requirements found in many other sets of health standards. However, some of the tasks are still too broad. For example, what does it mean for a middle school student to “analyze the relationship of physical, social, and mental health?” The standards regarding health are also so broad as to inhibit the development of performance indicators, benchmarks or other components of a coordinated system of standards, curriculum and assessment.

PHYSICAL EDUCATION

Important Subject Matter

In terms of important subject matter, the standards pertaining to physical education include most major topics, although with less length, specificity and rigor than the national standards for physical education, and are missing others. The national standards for physical education include competency in movement forms, learning and development of motor skills, a physically active lifestyle, a healthy level of physical fitness, appropriate personal and social behavior including understanding and respect for differences and knowledge that physical activity provides opportunities for enjoyment, challenge, self-expression and social interaction. While not articulated the same way, the standards in Minnesota incorporate most of the same ideas, as indicated in the chart below.

| National Standard categories | MN Primary | MN Intermediate | MN Middle | MN High School |
|---|---|---|--|--|
| competency in movement forms | -- | -- | -- | -- |
| learning and development of motor skills | demonstrate motor skills | demonstrate understanding of motor skills; demonstrating motor skills require for activities | participate in physical activities that develop motor skills; demonstrate motor skills for activities | demonstrate knowledge and skills in an aerobic activity and at least two other physical fitness activities |
| physically active lifestyle | participate in a daily fitness plan | participate in a daily fitness plan | describe components of fitness planning; evidence of implementing a fitness plan; describe benefit of daily participation in physical activities | designing and implementing a health-enhancing fitness plan |
| healthy level of physical fitness | improve age-appropriate physical fitness | showing evidence of age-appropriate fitness | evidence of age-appropriate physical fitness | designing and implementing a health-enhancing fitness plan |
| appropriate personal and social behavior | appropriate competitive and cooperative participation | describing rules, skills, strategies, and etiquette; display etiquette and team-building skills | display proper etiquette and team-building skills; describe etiquette associated with physical education activities | demonstrate understanding of ... the rules and skills associated with physical activities |
| knowledge that physical activity provides opportunities for enjoyment, challenge, self-expression, and social interaction | -- | -- | -- | -- |

Rigor and Progression and Grade-by-Grade Development

However, the standards for physical education are generally less rigorous than the national standards. For example, at grade 2, the national standards require students to “identify critical elements for fundamental skills and use them in performance” and “use feedback to improve performance.” By contrast, the primary level standard for Minnesota asks students only to “demonstrate motor skills required for individual and team activities.” Interestingly, that phrase is included in an almost identical form, with no discernable development, at the primary, intermediate and middle levels. By contrast, in the national standards, middle school students are asked to “demonstrate competency in many movement forms and proficiency in a few movement forms” and “identify the critical elements of more advanced movement skills.” A full four of the five standards at the intermediate level are repeated almost verbatim at the middle level, which indicates little evidence of increasing rigor and sophistication.

It is also possible to “meet the standard” and still have a very low level of understanding of the content or skills required. What is, at the middle level, reasonable “evidence of implementing a fitness plan?” This standard allows for wide variety in achievement — without clarifying what kind of evidence is sufficient, for example, or what a quality fitness plan would be.

Rigor is also inconsistent throughout this learning area. For example, some standards would seem to require more work than others do; demonstrating “age-appropriate physical fitness” typically involves performance of four to five items in a one-time assessment (with results highly dependent on genetics and short-term training). This does not particularly reflect a commitment to lifetime fitness. In the health standards, students are to develop a “nutritional plan” with rationale, menus and so on — a task that could require significantly more time and work and that has more long-term impact.

Balance of Knowledge and Skills

The standards for physical fitness do a fair job of balancing knowledge and skills. For example, at the intermediate level, student must both “describe rules, skills, strategies, and etiquette associated with various physical education activities” and “demonstrate motor skills required for individual and team activities.” However, as noted earlier, many requirements could be met with minimal knowledge.

One particular redundancy stands out in the standards for physical fitness. Etiquette appears to be of some importance, given that it appears in two separate standards at the intermediate (standards 1 and 5) and middle levels (standards 1 and 7). It is not clear why etiquette is mentioned in both and it is likely that the two similar standards could be condensed.

Clarity and Specificity

The specificity of the standards for physical fitness varies. At the high school level, the standard specifically mentions important topics and concepts as well as what the student is expected to know about them or do with them; for example, outlining that students should design and implement a health fitness plan and describing exactly what should be in such a plan. At the intermediate level, the standard is less specific. Students are to demonstrate motor skills, participate in a daily fitness plan, and display team-building skills; but little guidance is offered as to what these concepts involve and exactly what is expected of the student. What level of motor skills? What is considered appropriate evidence of participating in a fitness plan? What kinds of team-building skills? Standards this broad will be of little help to teachers and curriculum developers. This broad language also inhibits clarity of expectation. For the most part, the language used in the standards is clear, but on occasion, as noted, the expectations are not clearly articulated.

Measurability and Potential for Instruction

As with health, the requirements of the Profile for physical education are more easily measured than the requirements found in many other sets of health standards, since, for the most part, they

are framed by the application of the knowledge; whereas it is common to see health standards framed only as vague concepts. However, some of the tasks are still too broad, as described above.

CAREER EDUCATION

Career education is represented at the high school level in two standards that students and districts can choose from: Career Investigation and Occupational Experience. In Career Investigation students learn about career clusters, work skills and develop career plans.

Clarity and Specificity

This standard is fairly broad and vague and offers little in the way of specificity. Exactly what is expected of the student is not clear. For example, consider the requirement at the high school level that students “establish an explicit career action plan.” This is another case of substituting activities for skills and knowledge. What are students to be able to do as a result of this career action plan?

A standard for career education is also required at the middle level, which is admirable. Many systems leave this topic for high school only. That standard is, however, fairly brief and unspecific, and does not specifically include any experiences such as job shadowing, which many successful middle school programs do. The focus here is on researching career options. It might be worth considering having students get more in-depth on this topic. Note the requirements of the standard:

A student shall explore career and education options to make informed decisions for future life choices by:

- 1) determining areas of individual interest and ability;
- 2) determining at least two possibilities for career and education options that reflect personal interests and abilities;
- 3) gathering information for career options from a variety of sources; and
- 4) describing how each career might affect personal, family, and community life.

How useful is it for the student to research career options and, with little or no real-world knowledge, “describe how each career might affect personal, family, and community life?” This is a broad notion and difficult to communicate. Further, how does a student “determine areas of individual interest and ability?” Are they taking an aptitude test, choosing from a list or something else? What kind of information should students gather when they are asked to “gather information for career options from a variety of sources”? Examples, such as education requirements, skill needs, potential salary or future of the career in the developing economy, might be helpful in clarifying here.

Measurability and Potential for Instruction

To meet the standard for Occupational Experience in high school, students apply knowledge in real-work situations, including researching jobs, creating resumes and applications, and obtaining and working at an actual job. This standard is similarly broad and almost harder to measure. How are we to know if a student is “applying effective problem-solving strategies” in work situations, as this standard asks them to? And what does it mean to be “integrating technical knowledge and skills to achieve goals in an employment situation?” To make the standard more measurable, the state might want to consider making some of the standards more specific and detailed.

Important Subject Matter

While many important concepts of career education are addressed in these standards, students also have the ability to consider and research an economic analysis of labor markets, such as future demand for specific careers and fields. What students should be doing at the middle school level is setting goals for themselves and realizing what it will take to meet those goals, including identifying the education and skills they will need. The standard only marginally gets at these issues. Additionally, these standards are also missing a focus or emphasis on nontraditional jobs, as stressed in federal vocational law. It is important for both middle and high school students to explore career fields that are nontraditional to their gender. The state might want to consider adding wording to include these concepts.

Rigor

The standards for career exploration are written so broadly that it is difficult to tell the rigor required of a student. Like so many other requirements in the Profile, the work produced to meet these requirements will vary greatly in quality, because there is no clear articulation of exactly what quality is expected. A student could choose a career from a list and summarize a description of the career with the salary benefits, or, by contrast, interview several different professionals, consult Department of Labor statistics, and investigate the future of that career given developments in the economy, such as moving away from low-skills labor jobs and toward careers in the service, technology and healthcare industries.

As another example, how are we to know how well a student performed in their real-work situation, as required by the high school Occupational Experience standard? How well did a student “integrate technical knowledge and skills to achieve goals in an employment situation?” How will the student’s teacher evaluate that if it takes place outside the classroom? While it is valuable that the Profile has tried to integrate experiences outside the classroom into the Profile of Learning, it must be done in a way that can still be measured within the school system. Some schools will develop curricula for this part of the Profile that is challenging and includes high-level academic content. Others will barely prepare students for low level entry positions in the workplace. And all will be able to say that their students have “met the standard.”

Furthermore, one wonders about the differences between the two high school standards. Career Investigation involves research and reflection, while Occupational Experience involves some research and reflection and some sort of recording and analyzing actual job experiences. Is one designed to be easier than the other? Is Occupational Experience designed for lower-achieving students? This would have implications for rigor as well; if some students were to be held to a more rigorous standard than others are, the standards would be neither fair nor rigorous for all students. Increased specificity, however, can help address the issues with rigor.

SUMMARY REVIEW

LEARNING AREA: ECONOMICS AND BUSINESS

SUMMARY

The standards in Economics and Business, like the others in the Profile, are generally too broad. The topics covered are otherwise well done; however, many important concepts are missing, particularly in economics. Some of the topics are organized in a confusing manner; there is overlap with the Learning Areas of Inquiry and Research and Social Studies. The state might want to consider reorganizing some of the topics covered. Editing for additional clarity and specificity would also improve the standards.

INTRODUCTION

Economics and Business is a systems approach to several topics. At the high school level, students study economics from a systems perspective and choose from several other options, including Technical Systems, Financial Systems, Natural and Managed Systems, Personal and Family Resource Management, and Business Management. These options range from a practical overview of personal finance to a very conceptual discussion of natural and managed systems.

At the middle level, students cover each of the following: Personal Resources (time management, problem solving), Group Resources (teamwork), Informed Consumerism (a mix of basic economics and consumer issues) and Technology Applications (an overview of technology skills). These are also both practical and conceptual, and are extremely broad. At the primary and intermediate levels, students are introduced to technology with a focus on gathering information and producing products.

The standards are discussed by general topic: technology, economics and resources and systems.

TECHNOLOGY

Technology topics are found in Technology Systems at the high school level, in Technology Applications at the middle level, in Technology Skills at the intermediate level and Introduction to Technology at the primary level. These sections cover a portion of the topics considered to be important to technology education, but many significant topics are in fact missing. Additionally, many of the standards in these sections are exceedingly broad, use vague language and need to be clarified if they are to be of use to curriculum developers and teachers.

In terms of important subject matter, it should be noted that the recently released Standards for Technological Literacy¹³ contain the following topics:

¹³ There are two sets of national standards for technology. *Standards for Technological Literacy: Content for the Study of Technology* was released in April 2000 by the International Technology Education Association (ITEA).

- Nature of technology (scope, characteristics, core concepts, relationships between technology and other fields);
- Technology and society (cultural, social, political, economic, historical; environmental; ethical issues, consequences, impacts; role of society in development of technology);
- Design (attributes of design, design processes and principles, troubleshooting, research and development, invention, innovation, experimentation, problem solving);
- Abilities for a technological world (applying the design process, using and maintaining products and systems, assessing impact of products and systems); and
- The designed world (different types of technology: medical, agricultural, biotechnologies, energy and power, information, communication).

Many of these topics are absent or underemphasized in the Profile. Nothing is said about the different types of technology; the assumption appears to be that technology is about computers. There is nothing about technology and society, nothing about the nature of technology, and the role of design and the design process (including testing, feedback, troubleshooting, and controls) is highly glossed over.

It is, however, noteworthy that some form of technology education is required at the primary, intermediate and middle levels. Many school systems leave the topic out entirely or assume it will be taught in the context of other courses.

The fact that much important content and specificity are left out greatly affects the rigor of these sections. Basically, students in elementary school are only expected to gather information, produce products and use the keyboard. At the same level in the ITEA national standards, students have looked at the consequences of technology in many contexts, learned about the design process including troubleshooting and experimentation, followed steps to assemble something, and learned about processes and systems in other fields of technology such as medicine and agriculture. A great deal more can be expected of students in Minnesota than is outlined in the Profile.

In terms of specificity, both middle level and high school level sections are extremely broad, and it is not clear exactly of what elements the student is supposed to demonstrate mastery. For example, at the middle level, students are to “apply appropriate technology processes to an identified need or problem.” First, this standard is presented in the context of accessing information and producing products, limiting what students can do with their skills. Second, what are those appropriate technology processes and who decides what is appropriate? To what level of sophistication should a student demonstrate these processes? Without further specification, it is impossible to tell how rigorous this standard is, or even what a teacher should do with it. Students could be checking the printer cable or designing a whole new system. As with so much of the Profile, these standards could be interpreted in so many ways as to render them less than useful as statewide standards, given the variety in the results they would produce.

National Educational Technology Standards for Students (NETS) was published in June 1998 by the International Society for Technology in Education (ISTE).

This lack of specificity also severely inhibits measurability and potential for instruction. With added detail and specificity, these sections would be fairly measurable. The state and districts will, however, be sure to delegate responsibility for teaching the topics in technology clearly. Technology is not always a traditional topic in schools with a defined set of responsibilities for teaching it. Each teacher may think that another is covering it. Careful curriculum planning will make the requirements manageable.

The standards relating to technology do have an appropriate balance of knowledge and skills, although it should be noted that in many places they are so broad that it is difficult to tell if any knowledge or skills are articulated.

In terms of progression and development, some of the ways of showing progression between grades seem somewhat arbitrary. At the primary level, students are “producing products and selecting language, format, and graphics appropriate for purpose and audience by using word processing.” The intermediate level has students doing the exact same thing except it adds the words “and multimedia presentation” at the end. At the middle level, spreadsheets and databases are added. What makes primary students unable to use spreadsheets or multimedia presentations? Is the only manifestation of increasing skill the concept of producing different kinds of products? In the national standards published by the International Society for Technology in Education, grade 2 students are creating “developmentally appropriate multimedia products with support.” Another standard is identical at the intermediate and middle levels, stating, “use appropriate computer technology to access, evaluate, and organize information and to complete [produce] products by: gathering and evaluating information from electronic sources.” This redundancy and lack of clear development of skills inhibits the rigor and sophistication of the document.

Further, there is little groundwork laid at the lower levels for the understanding of technology and other systems called for at the high school level.

ECONOMICS

The Profile of Learning addresses economics in the Learning Area of Economics and Business, where all high school students according to the state default requirement must complete Economic Systems. Some principles of personal economics are also found in the area of Personal and Family Resource Management at the high school level, and in Informed Consumerism at the middle level. While it is admirable that Minnesota recommends some form of economic study from all students (many states still do not), approaching economics from a systems perspective, as is done in the Economic Systems standard, causes a great deal of important content to be lost at the high school level. In terms of important subject matter, the emphasis in this systems approach Economic Systems is on how systems interact and on the complexities of using resources in production, distribution, and consumption. While these issues are certainly vital, this section downplays concepts including supply and demand, benefits and costs, incentives, investment, and competition. An understanding of information about the American economy — including gross domestic product, unemployment, interest rates, inflation and rates of economic growth — is missing completely. At the high school level, there is a large gap in understanding about how the economy affects individuals’ lives as workers, consumers and citizens, such as

concepts of the labor market and how supply and demand can affect individual incomes; some of this material, however, is included in Informed Consumerism. There is little specific content about the roles of government in the economy. It is unclear why the Profile chooses to approach economics from this systems viewpoint (and not, for example, include it in People and Cultures) or if any research supports such a decision. Without such support, the concern for the missing content must be noted.

In Personal and Family Resource Management, students practice skills of personal economics. These skills, such as preparing a personal income tax statement, selecting investment options and evaluating banking options, are all excellent ways to apply economic skills and knowledge. It should be noted, however, that nowhere in Economics and Business do students gain the background knowledge necessary to complete these tasks. They do not study interest rates — a topic that would surely be of use in examining investment and savings options. They do discuss the role of government in the economy, limiting their understanding of taxes. They do not learn about the concept of substituting goods, limiting their ability to analyze household purchases. This section would have a great deal more meaning if it were backed up by actual economic content, without which practicing the skills of resource management will be empty.

At the middle level, students get some exposure to ideas about consumers in Informed Consumerism. However, only some of the standards in this section provide a student with a grounding in economics; the rest serve only to help the student be, as the title implies, an “informed consumer.” In terms of important subject matter pertaining to economics, this section includes the idea of wants, needs and available resources, giving the student some grounding in scarcity. There is an attempt to show the circular nature of the economy as students are to demonstrate an understanding of “the impact of purchases in a household, business, community, and environment,” but this idea is phrased so vaguely as to be confusing.

Beyond the missing concepts, it should also be noted that the standards pertaining to economics vary in rigor. Like so many other standards within the Profile, teachers and students could interpret the standards in Economic Systems in so many different ways that it is impossible to determine rigor. For example, part D reads, “examining how domestic and global systems interact.” It is unclear what this standard means and what expectation for the student is implied. It could be met by a short paragraph or a lengthy project, by addressing a single issue or many. Some of the standards actually limit the knowledge students could gain. Part A, which reads, “analyzing a public issue in terms of production, distribution and consumption,” has several flaws. Not all public issues can be analyzed in terms of production, distribution and consumption; and not all issues of production, distribution, and consumption are public. Second, by limiting economic discussion of public issues to those three contexts, many bigger-picture nuances of public goods and issues may well be lost.

Rigor (and grade-by-grade development) is also a shortcoming for Personal and Family Resource Management. While many of the standards are appropriately rigorous, several are at more of a 5th and 8th grade level, such as creating a plan for major purchases, something other states target to 8th graders. Also, personal finance terminology is often addressed at the 5th or 6th grade level.

Informed Consumerism is also seriously lacking in rigor. Students engage in activities including “describing a variety of purchases over time,” which could be met, for example, by simply making a list of how many sodas a student purchased in a week. Middle school students can engage in far more engaging and academic learning about the economy and how it works.

In terms of the balance of knowledge and skills, both are implied, but both are incomplete. Economics is a highly conceptual topic, yet it is deeply ingrained in the daily lives of individuals and institutions; and thus applying its principles is essential. Some standards in Economic Systems, such as B, which says, “how change in the economy affects individuals, households, business, government, and the environment,” imply that students will be applying important concepts and principles to reality. However, it is not at all clear which principles will be applied or how. The first sentence of the section states that students will “use the fundamental concepts of economics.” Which ones? How will teachers, students, schools or districts know which concepts are implied by this standard?

The standards in Economic Systems are also lacking somewhat in specificity. Key words and topics are mentioned, but the expectations are vague. For example, part B, which reads, “analyzing how change in the economy affects individuals, households, government, and the environment,” is extremely vague and involves any number of concepts; it is unclear what kind of change is implied. This standard could be interpreted by teachers in many ways and sets no standard for achievement to which teachers and students can hold themselves. This standard is also an example of lack of clarity. The set-up of the standards further confounds the level of clarity. The following is an example of unclear sentence structure and language:

Through the use of the fundamental concepts of economics, a student shall demonstrate understanding of the interactive nature of global, national, and local systems, how government decisions impact those systems, and how individuals, households, businesses, and governments use scarce resources to satisfy unlimited wanted and needs by:

- A) analyzing a public issue in terms of production, distribution, and consumption;
- B) analyzing how change in the economy affects ...
- C) explaining how scarcity of productive resources impacts ...
- D) examining how domestic and global economic systems interact; and
- E) comparing the rules and procedures of different economic systems ...

This one sentence is extremely long and packs in so many concepts that it is no longer clear what students are to know and do. It might be clearer if broken into separate sentences. This lack of clarity and specificity inhibits the measurability and potential for instruction of this section.

Specificity is somewhat improved in Personal and Family Resource Management. Asking a student to “analyze and select investment options” is fairly specific and will be useful to teachers in planning curriculum. However, “analyzing how to manage household resources considering broader economic and environmental systems” is still far too broad and needs clarification.

Specificity is, however, lacking in Informed Consumerism. It is unclear what is meant by “evaluate the quality of products or services,” for example. Evaluate in what sense? What criteria are intended? Can the evaluation be a student’s personal opinion of a pair of shoes, or do they

have to look up what *Consumer Reports* has to say on the topic? What counts as an evaluation? This lack of clarity about expectations inhibits the measurability and potential for instruction of this section as well.

In terms of focus and manageability, while many important topics have been left out of Economic Systems, it is possible that such omissions might have been an attempt to focus the standard and allow for depth of knowledge and a smaller number of topics. However, because the expectations are so vague, the standard remains unfocused and difficult to manage. Both Informed Consumerism and Personal and Family Resource Management, however, are focused and manageable.

RESOURCES AND SYSTEMS

There were few specific comments in the reviews on the remaining sections of Economics and Business, reflecting their disciplinary confusion; it is unclear who has responsibility for them. It is difficult to imagine that things will be any different in schools across Minnesota. However, it was noted that Natural and Managed Systems might be better placed in the section on Environmental Systems in the Learning Area of Scientific Applications. Similarly, the sections on technology might well be included in Inquiry, and as mentioned, Economic Systems might fare better in People and Cultures. Finally, Personal and Family Resource Management and Informed Consumerism seem to be just as much about Decision Making as anything else and might well belong in that learning area.

ADDITIONAL COMMENTS

Natural and Managed Systems is found to be very broad in nature and consequently somewhat confusing. What does it look like for a student to “develop and communicate a resource management plan involving natural and managed systems?” Is this standard about environmental studies? If so it may well be better suited to the Scientific Applications Learning Area.

Business Management and Financial Systems are clearly stated. Business Management is, however, more broad and harder to measure than Financial Systems. What does it mean to “analyze business expenses and organizational and environmental costs?” Without further detail or context this standard is too vague to be of much use to teachers. It is not clear what exactly is expected of students or what concepts they need to know. This issue will inhibit its measurability and manageability.

APPENDIX C:
MATERIALS CONSULTED

MATERIALS CONSULTED

STATE OF MINNESOTA PUBLIC AND INTERNAL MATERIALS

1. Profile of Learning Rules (Full Copy), May 18, 1998
2. Profile of Learning Rules (with Repealers)
3. Minnesota Statutes M.S. 120B (Standards) with Repealers
4. Summary of 2000 Session Laws Relating to the Profile of Learning, June 5, 2000
5. Notice of Intent to Adopt Rules Amendments (2000 session)
6. Rules Relating to Graduation Standards (Math, Reading, and Written Composition)
7. Adopted Permanent Rules: Passing Scores for State Tests of Basic Requirements
8. Conference Committee Report: 2000 Session Laws
9. CFL Report to Legislature on Student Achievement Levels, January, 2000
10. Minnesota State Board of Education Report on Graduation Standards, 1998
11. CFL Graduation Standards Advisory Panel Recommendations, December 1998
12. CFL Report to the Legislature on Graduation Standards, 1999
13. CFL Report to the Legislature on Graduation Standards, 2000
14. Senate Office of Fiscal Policy Analysis Profile of Learning Implementation Report, September 2000
15. Minnesota Educational Accountability Reporting System Feasibility and Design Study, Volume I
16. Local Record Keeping Interdistrict and State Reporting, December 1999
17. CFL Completion Study for the Class of 1998: Computation of the Four-Year Graduation and Dropout Rates for School Districts in Minnesota, January 2000
18. Links Between Research and Reform, April 5, 2000
19. Statement of Need and Reasonableness, Profile of Learning
20. Statement of Need and Reasonableness (Math, Reading, and Written Composition)
21. Scoring Criteria, Primary, Intermediate, Middle, and high school levels
22. Minnesota K–12 People and Cultures Curriculum Framework
23. Minnesota K–12 Mathematics Framework
24. Framework for Arts Curriculum Strategies
25. A Framework for Minnesota Standards-Based Education in Health and Physical Education
26. Video: Outstanding Student Work in Inquiry Learning Area
27. Video: Outstanding Student Work in People and Cultures Learning Area
28. Video: Outstanding Student Work in Write and Speak Learning Area
29. Best Practices Networks, General Information
30. Pilot Site Information
31. Catalog of Learning Opportunities, Summer 2000

32. CD-ROM: Scoring with Criteria
33. Graduation Standards Technicians Information
34. <http://www.educ.state.mn.us/>

Independent Reports

- William A. Firestone and Gregory Camilli, "State Standards, Socio-Fiscal Context and Opportunity to Learn in New Jersey," as summarized in Rutgers University Graduate School of Education Center for Educational Policy Analysis newsletter, Standards, Tests and Access to Knowledge in New Jersey, May 2000.
- Katherine A. Kersten, *Minnesota's Profile of Learning: The Radical Mutation of a Good Idea*, American Experiment Quarterly, Summer 1999, pp. 33–60.
- Office of Educational Accountability, University of Minnesota, The 1999 Minnesota Education Yearbook, March 2000.
- Mitchell B. Pearlstein, Strange Brew: Minnesota's Motley Mix of School Reforms, published by the Fordham Foundation, January 2000.
- Washington Partnership for Learning, Making Standards Work: Summary Report, 1999.
- Washington Partnership for Learning, Making Standards Work: Summary Report, 2000.
- Roy Wilkins Center for Human Relations and Social Justice, Hubert H. Humphrey Institute of Public Affairs, University of Minnesota, Analysis of the 1996 Minnesota Basic Standards Test Data, March 1997.

Articles

- Howard Gardner and Veronica Boix-Mansilla, "Teaching for Understanding in the Disciplines – and Beyond," *Teachers College Record*, V. 96, No. 2, Winter 1994, pp.198-218.
- Margaret E. Goertz, "Implementing Standards-Based Reform: Challenges for State Policy," *Closing the Gap*, February 2000, Council for Basic Education.
- Michael Katims, "Assessment Literacy and Best Assessment Practices: Critical Components of a New Foundation for Teaching," paper prepared for Wingspread Conference, September 2000, Council for Basic Education.
- Bess Keller, "Minn. Reaches Uneasy Accord Over Learning Standards," *Education Week*, May 31, 2000.
- Minnesota Star Tribune and St. Paul Pioneer Press, Articles Relevant to the Profile of Learning and Supporting Policies, January 31, 1998–September 6, 2000.
- Joanna Richardson, "Support for Minnesota Standards May Be Wavering," *Education Week*, April 27, 1994.
- Joanna Richardson, "Minn. District Scraps O.B.E. Experiment Seen as a Model," *Education Week*, June 1, 1994.
- Kathleen J. Roth, "Second Thoughts About Interdisciplinary Studies," *American Educator*, Spring 1994, pp.44-47.

APPENDIX D:

**LISTS OF STANDARDS EXPERTS AND
INDIVIDUALS PARTICIPATING IN INTERVIEWS**

EXPERT REVIEWERS

Mike Aiello

Science Teacher, San Luis Obispo High School,
Former California Teacher of the Year

Lewis Atkinson

Executive Director to the Deputy Secretary of
Education, Delaware Department of Education

Earl Bell

Chair, History Department, The Laboratory
Schools, The University of Chicago

Roger Downs

Department Head and Professor, Department of
Geography, Pennsylvania State University

Sue Eddins

Curriculum and Assessment Leader, Illinois
Mathematics and Science Academy

Carol Jago

English Teacher, Santa Monica High School,
Santa Monica Unified School District,
California, Director, California Reading and
Literature Project

Erich Martel

Social Studies Teacher, Woodrow Wilson High
School, District of Columbia Public Schools

Charlie Peters

Consultant, Secondary English Language Arts,
Oakland Schools, Michigan

Joan Peterson

Director, Assessment and Standards
Development Services, WestEd

Susan Pimentel

Cofounder, StandardsWork

Harold Pratt

Former Director, K-12 Science Division, Center
for Science, Mathematics, and Engineering
Education, National Academy of Sciences

Senta Raizen

Director, National Center for Improving Science
Education

Scott Shuler

Arts Consultant, Connecticut Department of
Education

W. Chris Stewart

Educational Dimensions, Inc.

John Webb

Department Chair, World Languages, Hunter
College High School, NY, NY

Hung-Hsi Wu

Professor of Mathematics, University of
California at Berkeley

Judith C. Young

Executive Director, National Association for
Sport and Physical Education

INDIVIDUALS PARTICIPATING IN MEETINGS AND INTERVIEWS

Jim Bartholomew

Minnesota Business Partnership

Bill Blazar

Senior Vice President, Minnesota Business Partnership

Mary Burts

Assistant Dean, University of Minnesota College of Education

Tim Caroline

Principal, Moose Lake School

Mark Davison

Minnesota Office of Education Accountability

Jackie Fradrich

Robbinsdale Public Schools

Claudia Fuentes

Urban Coalition

Brent Gish

Superintendent, Mahnommen School District

Vernae Hasbargen

Minnesota Rural Education Association

Sandra Hayes

Teacher, Becker Public Schools

Wayne Hayes

Governor's Office

Susan Heegard

Minnesota Private College Council

Gary Jensen

Assistant Superintendent for Curriculum and Instruction, Hastings Public Schools

Katherine Kersten

Center for the American Experiment

Harry Mares

Minnesota House of Representatives

Tom Nelson

Superintendent, Buffalo Schools

Bob Ness

Minnesota House of Representatives

Kimberly Norton

President, Minnesota PTSA

Gen Olson

Minnesota State Senate

Valerie Pace

IBM Community Relations

Elaine Phillips

Director of Teaching and Learning, Fridley Schools

Gene Pelowski

Minnesota House of Representatives

Larry Pogemiller

Minnesota State Senate

Al Quie

Former Governor, Minnesota

Alice Seagren

Minnesota House of Representatives

Lloyd Styrwooll

Superintendent, Grand Rapids

Scott Staska

Superintendent, Yellow Medicine East

Camille Waezecha

Little Falls School Board