The Partnership for 21st Century Skills is a public-private organization of leaders and educators in business and education that works to close the gap between the knowledge and skills most students learn in school and the knowledge and skills they need in a typical 21st century community and workplace. The Partnership's work includes: synthesizing research, insights, and best practices about 21st century knowledge and skills into a powerful vision and sharing this information broadly; defining a framework and creating a common language for understanding and promoting 21st century skills; providing education leaders with tools, examples, and strategies for action; and building consensus in the public and private sectors about the nature and need for 21st century skills. This report examines the essential skills that people will need today and tomorrow. The six key elements of 21st century learning include emphasizing core subjects and learning skills, using 21st century tools to develop learning skills, teaching and learning 21st century content in a 21st century context, and using 21st century assessments that measure 21st century skills. Nine steps to build momentum include embracing a powerful vision of public education that includes 21st century skills, developing priorities for 21st century skills, and collaborating with outside partners. In addition to the report, a companion guide for getting started is also provided, the Partnership's "Milestones for Improving Learning and Education (MILE) Guide" for 21st century skills. (Contains 134 references.) (SM)
A Report and MILE Guide for 21st Century Skills
The Partnership for 21st Century Skills is a unique public-private organization formed in 2002 to create a successful model of learning for this millennium that incorporates 21st century skills into our system of education.

**Members**
- AOLTW Foundation
- Apple Computer, Inc.
- Cable in the Classroom
- Cisco Systems, Inc.
- Dell Computer Corporation
- Microsoft Corporation
- National Education Association
- SAP

**Key Partners**
- U.S. Department of Education
- Appalachian Technology in Education Consortium

**Strategic Partners**
- Consortium for School Networking
- ISTE
- SETDA
- Tech Corps
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LEARNING FOR THE 21ST CENTURY

LETTER TO AMERICA’S EDUCATION LEADERS

From the Board of the Partnership for 21st Century Skills

How can we best prepare students to succeed in the 21st century? This is a question of paramount importance to America's educators, employers, parents and the public. Our community vibrancy, personal quality of life, economic viability and business competitiveness depend on a well-prepared citizenry and workforce. Public education provides the bedrock from which our national and individual prosperity rise together.

The No Child Left Behind Act of 2001, which reauthorizes the Elementary and Secondary Education Act of 1965, emphasizes student achievement and requires assessments in core subjects, which are the foundation for learning. This federal law is focusing the attention of schools and educators on fundamental knowledge and skills.

This is an excellent start. We can do even more. The nation needs a compelling vision for education that will inspire education leaders, teachers, parents and students alike. Clearly, we must work together to fully prepare people for the challenges of work and life in the 21st century.

The Partnership for 21st Century Skills, a unique public-private organization of leaders and educators in business and education, has come together to help schools fully address the educational needs of the 21st century. With this, our first report, we articulate a unified, collective vision for education and a framework for action. We also provide a companion guide for getting started, our Milestones for Improving Learning and Education (MILE) Guide for 21st century skills. We developed both the report and the MILE Guide through a comprehensive process involving hundreds of educators, researchers and employers across the country.

We recognize that we are calling on schools to change dramatically even as they face difficult economic challenges and a vigorous discussion of student achievement and assessments. However, while current budget constraints eventually will subside, the long-term need for 21st century learning will not: Accelerating technological change, rapidly accumulating knowledge, increasing global competition and rising workforce capabilities around the world make 21st century skills essential.

We are committed to promoting a national dialogue about 21st century skills — and to resolving issues about teaching either basic skills or 21st century skills. Both are essential and, when done concurrently, each reinforces the other. We urge you to join this discussion and help us build consensus and momentum for education that integrates knowledge and skills that are relevant to the 21st century. To that end, we are launching a public awareness campaign to engage people in this national dialogue. We are exhilarated by the progress educators, employers and public leaders have made in promoting 21st century skills and contributing to this vision. As you read this report, we hope you will share the Partnership's excitement about the educational opportunities made possible by the prospect of communities using and adapting this vision to make real progress for children in the 21st century.

Terry Crane, Ed.D.
Vice President for Education,
AOL, Inc.
On behalf of AOLTW Foundation
Chair, Partnership for
21st Century Skills

Amelia Maurizio, Ed.D.
Director, Educational
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Treasurer, Partnership for
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Karen Bruett
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Vice-Chair, Partnership for
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Peggy O'Brien, Ph.D.
Executive Director
Cable in the Classroom/NCTA
Education Foundation

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In recent years, educators at the local, state and national levels have focused on improving student achievement — the perennial top priority of public concern. States and school districts have established rigorous academic standards, assessments and accountability measures — a concerted effort that has involved thousands of educators, employers and community members nationwide. Schools have responded with strategies to improve teaching and learning.

There remains, however, a profound gap between the knowledge and skills most students learn in school and the knowledge and skills they need in typical 21st century communities and workplaces. The Partnership for 21st Century Skills, a group of major business and education organizations, formed in 2002 to work on closing this gap. The Partnership is committed to promoting a national dialogue about 21st century skills, integrating them into K-12 schools and encouraging the development of curriculum and assessments that reflect 21st century realities.

This Partnership's work builds on the significant progress of recent years. In fact, the recommendations in this report complement No Child Left Behind and provide a vision for capturing the full range of 21st century skills in the assessments the law requires. This initiative is a broad-based public-private partnership in the finest sense.

The Partnership is contributing to improving education in several distinct ways:

- Synthesizing research, insights and best practices about 21st century knowledge and skills into a powerful vision and sharing this information broadly.
- Defining a framework and creating a common language for understanding and promoting 21st century skills.
- Providing education leaders with tools, examples and a strategy for action, not more rhetoric.
- Building consensus in the public and private sectors about the nature and need for 21st century skills.

In our first year, we focused on creating a common framework and language for 21st century skills. This report captures the findings of a comprehensive effort to identify the essential skills that people need today — and tomorrow. To reach this point, the Partnership conducted a National Forum on 21st Century Skills in 2002; held...
outreach sessions with educators, employers, parents, community members and students; and built consensus for a common framework and language in this report. (To learn more about our outreach efforts, see Appendix A on page 26.) We also conducted extensive research on 21st century skills, which is reflected in this report.

**Defining the need for change**

Economic, technological, informational, demographic and political forces have transformed the way people work and live. These changes — and the rate of change — will continue to accelerate. Schools, like businesses, communities and families, must adapt to changing conditions to thrive.

Today's education system faces irrelevance unless we bridge the gap between how students live and how they learn. Schools are struggling to keep pace with the astonishing rate of change in students' lives outside of school. Students will spend their adult lives in a multitasking, multifaceted, technology-driven, diverse, vibrant world — and they must arrive equipped to do so. We also must commit to ensuring that all students have equal access to this new technological world, regardless of their economic background.

Moreover, we know more today than ever about how students learn. Researchers and educators in recent years have made great strides in mapping the remarkable territory of the human mind. We now have scientific insights that can inform educators about the cognitive processes of learning, effective teaching strategies for engaging students in learning and motivating students to achieve. We must incorporate this understanding into classroom teaching and learning on a broad scale.

Against this backdrop, literacy in the 21st century means more than basic reading, writing and computing skills. It means knowing how to use knowledge and skills in the context of modern life. As writer Alvin Toffler points out, "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn and relearn."

**What is the Partnership's vision for education and 21st century skills?**

Standards, assessments and accountability measures set by states, implemented by school districts and underscored by No Child Left Behind are the starting point for strong schools and student achievement. To complement these efforts, schools need to increase emphasis on the additional knowledge and skills students will need for the 21st century. This is an opportune time to align standards, assessments and accountability measures with 21st century skills.

**Critical elements for creating 21st century skills**

There are six key elements for fostering 21st century learning:

1. **Emphasize core subjects.** Knowledge and skills for the 21st century must be built on core subjects. No Child Left Behind identifies these as English, reading or language arts, mathematics, science, foreign languages, civics, government, economics, arts, history and geography. Further, the focus on core subjects must expand beyond basic competency to the understanding of core academic content at much higher levels.

2. **Emphasize learning skills.** As much as students need knowledge in core subjects, they also need to know how to keep learning continually throughout their lives. Learning skills comprise three broad categories of skills:
   - information and communication skills,
   - thinking and problem-solving skills, and
   - interpersonal and self-directional skills.

   Good teachers always have fostered these skills. The challenge now is to incorporate learning skills into classrooms deliberately, strategically and broadly. (For more on learning skills, see the chart on page 9.)

3. **Use 21st century tools to develop learning skills.** In a digital world, students need to learn to use the tools that are essential to everyday life and workplace productivity.

   Skilled 21st century citizens should be proficient in ICT (information and communication technologies) literacy, defined by the Programme for International Student Assessment (PISA) as "the interest, attitude and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate and evaluate information, construct new knowledge, and communicate with others in order to participate effectively in society."

4. **Teach and learn in a 21st century context.** Students need to learn academic content through real-world examples, applications and experiences both inside and outside of school. Students understand and retain more when their learning is relevant, engaging and meaningful to their lives. In the global, networked environment of the 21st century, student learning also can expand beyond the four classroom walls. Schools must reach out to
their communities, employers, community members and, of course, parents to reduce the boundaries that divide schools from the real world.

5. TEACH AND LEARN 21ST CENTURY CONTENT. Education and business leaders identified three significant, emerging content areas that are critical to success in communities and workplaces:

- global awareness;
- financial, economic and business literacy; and
- civic literacy.

Much of this content is not captured in existing curricula or taught consistently with any depth in schools today. An effective way to incorporate this content is to infuse knowledge and skills from these areas into the curriculum.

6. USE 21ST CENTURY ASSESSMENTS THAT MEASURE 21ST CENTURY SKILLS. States and districts need high-quality standardized tests that measure students' performance of the elements of a 21st century education.

However, standardized tests alone can measure only a few of the important skills and knowledge we hope our students will learn. A balance of assessments — that is, high-quality standardized testing for accountability purposes and classroom assessments for improved teaching and learning in the classroom — offers students a powerful way to master the content and skills central to success in the 21st century. To be effective, sustainable and affordable, sophisticated assessment at all levels must use new information technologies to increase efficiency and timeliness.

NINE STEPS TO BUILD MOMENTUM

- Embrace a powerful vision of public education that includes 21st century skills.
- Align leadership, management and resources with educational goals.
- Use this tool to assess where schools are now.
- Develop priorities for 21st century skills.
- Develop a professional development plan for 21st century skills.
- Make sure students have equitable access to a 21st century education.
- Begin developing assessments to measure student progress in 21st century skills.
- Collaborate with outside partners.
- Plan collectively and strategically for the future.

HOW CAN SCHOOL LEADERS MOVE FORWARD WITH THIS VISION?

The Partnership's work emphasizes learning — not simply what students are learning, but how they are learning as well. Our vision is not a daunting list of “add-ons” to educators' already full job responsibilities. Incorporating 21st century tools more effectively into administrative routines and school classrooms, for example, will give educators more time to concentrate on teaching and learning. Infusing dynamic, real-world contexts into classroom learning will invigorate teacher and student engagement. Modernizing assessment methods will give educators real-time information they can use to help their students today, instead of months after students have moved on to another classroom or school. In short, educators can expect positive results for themselves and for their school systems.

This is the right time for states and school districts to begin integrating 21st century skills into education. States and school districts already are thinking seriously about improving the quality of teaching and learning as they respond to No Child Left Behind. Skills for the 21st century are central to this important endeavor. While states and school districts now face a challenging economic environment, the need for 21st century skills is not going away. Indeed, it will only become more important with time. Strategic, long-term planning now to integrate 21st century skills into standards, curricula, assessments and professional development will be more effective in the long run than adding them piecemeal later.

This report complements the work of the CEO Forum on Education and Technology, which developed the STaR (School Technology and Readiness) Chart. That work focused on building a technology infrastructure and support system in schools. The challenge now is to emphasize other key elements of learning and leverage existing technology to truly make a difference in student achievement. This is an ambitious challenge, but one that should engage and energize education leaders, teachers and parents alike. In the Partnership's view, nothing is more important for education today than beginning to make 21st century skills a reality.

Education leaders can start today with ideas in Implementing 21st century skills: Nine steps to build momentum, which begins on page 20, and in Making a difference: How key stakeholders can support the effort, which begins on page 24. Educators can also refer to the foldout MILE Guide for 21st Century Skills, which provides practical guidance for assessing schools now and envisioning how they can prepare for the future.

Visit our Web site to learn more and to share your experiences in implementing a 21st century education.

www.21stcenturyskills.org
Successful businesses are looking for employees who can adapt to changing needs, juggle multiple responsibilities and routinely make decisions on their own. Today's economy "places value on broad knowledge and skills, flexibility, cross-training, multi-tasking, teaming, problem-solving and project-based work." According to Federal Reserve Board Chairman Alan Greenspan, there will be an evolving demand for 21st century skills in our economy: "Workers in many occupations are being asked to strengthen their cognitive skills; basic credentials, by themselves, are not enough to ensure success in the workplace. Workers must be equipped not simply with technical know-how but also with the ability to create, analyze and transform information and to interact effectively with others. Moreover, that learning will increasingly be a life-long activity."

The world in which students live has changed dramatically and schools must change as well, as they have in the past, to meet the demands of the agricultural, industrial and Cold War eras. The explosion of powerful technology has altered traditional practices in workplaces and communities. Fifty years ago, factory and office workers worked on a single machine, performing the same task day after day. Technology has simplified and, in some cases, eliminated such routine tasks, which means there are increasingly fewer positions available to workers with minimal skills. By contrast, there are more opportunities for highly skilled workers. Today, factory and office workers perform multiple tasks on much more sophisticated machines and electronic equipment in workplaces that are constantly evolving to respond to market expectations for customized products and services.

"How has the world of a child changed in the last 150 years?"
And the answer is, "It's hard to imagine any way in which it hasn't changed."
Children know more about what's going on in the world today than their teachers, often because of the media environment they grow up in.
They're immersed in a media environment of all kinds of stuff that was unheard of 150 years ago, and yet if you look at school today versus 100 years ago, they are more similar than dissimilar.

-- Peter Senge, senior lecturer at the Massachusetts Institute of Technology
competitors as likely to live in India as in Indianapolis. Moreover, flattened hierarchies in competitive businesses require employees to make business decisions, work productively in teams and communicate directly with customers. In this environment, employers value job candidates who can acquire new knowledge, learn new technologies, rapidly process information, make decisions and communicate in a global and diverse society.

**Education that connects to students' lives**

For many students, the impact of technology on everyday life is no surprise. They connect with their friends via e-mail, instant messaging and chat rooms online; search the Web to explore their interests; express themselves fluently using new media; learn with educational software; play video and computer games in virtual realities; manipulate digital photos; go behind the scenes on DVDs; channel surf on television; and chat on and take photographs with cell phones. Through the media, they identify with their peers in the global culture through music, games, toys, fashion, animation and movies.

Likewise, today's students already are immersed in 21st century communities and lifestyles. For example, an increasing proportion of the student population speaks a language other than English. In 2000, 17 percent of all public school students were Hispanic, according to the National Center for Education Statistics; for many of these students, English is a second language. By 2025, nearly one in four school-age children will be Hispanic. Students live in increasingly diverse communities; in many urban school districts, it is not unusual to find more than 100 different native languages and home cultures among student populations whose extended families may span the globe.

Education that prepares students for learning in this complex, digital society will be more meaningful to students and, ultimately, more effective in preparing them for the future. A powerful vision of public education is critical for closing the gap between how students live and how they learn in school. Students who have access to technology outside of school will find schools without access to and integration of technology into their coursework to be antiquated and irrelevant to their world. Students without this access at school or at home may find themselves on the periphery of 21st century society. For these reasons, 21st century skills must be a local, state and national priority.

**Education that reflects how people learn**

Another important development underscores the need to adapt education for the 21st century: a deeper understanding of how people learn. A 2000 report of the National Research Council, *How People Learn: Brain, Mind, Experience, and School*, synthesized this body of research into these key findings:

1. Students come to the classroom with preconceptions about how the world works. If teachers do not use this prior knowledge to build new understanding, students may fail to grasp the new concepts and information they are taught, or they may learn them for purposes of a test but revert to their preconceptions outside of the classroom.

2. To develop competence in an area of inquiry, students must have a deep foundation of knowledge, understand facts and ideas in the context of a conceptual framework, and organize knowledge so they can retrieve and apply it.

3. A metacognitive approach to instruction, in which students are taught to think deliberately about how they are learning, can help students take control of their own learning, monitor their own progress and improve their achievement.

These findings have profound implications for teaching and learning in the 21st century. It is incumbent on this generation of leaders and educators to incorporate the insights of research into teaching strategies for K–12 classrooms. While many schools gained from using some of these approaches to help students learn, the challenge today is to make these approaches the norm in all U.S. schools. The vision for education presented in the next section will help policymakers and educators align student achievement with 21st century expectations — by building on the good work they already have started in many places.
Part II

THE KEY ELEMENTS OF 21ST CENTURY LEARNING

The Partnership for 21st Century Skills supports federal, state, and local initiatives to give students a solid foundation in core subjects and core content and to monitor progress with assessment and accountability measures.

However, the Partnership feels strongly that other necessary pieces of an effective education are needed for the 21st century as well. Adding these key elements where they are missing — and measuring them with 21st century assessments — will make the core subjects relevant to the world in which students live and eventually may work. Moreover, these key elements will help improve student achievement; more effectively address the needs of students with special challenges, such as English language learners and students with disabilities; and help schools meet the intent of No Child Left Behind. This section outlines the framework the Partnership recommends to make this happen.

SIX ELEMENTS OF A 21ST CENTURY EDUCATION

To strengthen core subjects and move toward a 21st century education, there are six elements schools can incorporate:

- Emphasize core subjects.
- Emphasize learning skills.
- Use 21st century tools to develop learning skills.
- Teach and learn in a 21st century context.
- Teach and learn 21st century content.
- Use 21st century assessments that measure 21st century skills.

EMPHASIZE CORE SUBJECTS

Core academic subjects remain the foundation of a good education. This is as true today as it was 100 years ago. In the words of noted educator Jerome Bruner, learning core subjects makes it possible for students “to participate in the process that makes possible the establishment of knowledge … and to take part in the process of knowledge-getting.”

Our understanding of core subjects and students’ course-taking patterns in these subjects continue to evolve to respond to changing times. In past decades, core subjects were defined as English language arts, mathematics, science and social studies. In its 1983 report A Nation at Risk, the National Commission on Excellence in Education recommended that high school students take four years of English, three years of mathematics, three years of science and three years of social studies. College-bound students were encouraged to add two years of a foreign language. Today, more students are taking these courses, which the Commission called the “new basics.” In 1982, less than 14 percent of graduates took this sequence of courses, compared to 56 percent in 1998.

A Nation at Risk also called for computer programming to be included as a “new basic,” but since then, the world has gone through a technology revolution. This revolution has led to the need for all students to be technology literate. Recognizing this, No Child Left Behind requires that students be technology literate by the end of the eighth grade.

One key competency that employers across-the-board value in employees is the ability to think creatively and logically in order to solve problems.

Such employees are most likely to be promoted in an unforgiving global economy that requires flexibility and an ability to develop new skills. The ability to think, speak, and write logically, to solve problems, and to synthesize information are also priority competencies cited by postsecondary faculty members from all disciplines.

— The American Diplomacy Project
Moreover, to position themselves to take the recommended course sequences in high school, students must start learning core subjects early. "Several studies have shown that instruction in the core curriculum at the earliest level is important, as exposure to subjects at the elementary level is related to courses students take at the secondary level," according to the National Center for Education Statistics at the U.S. Department of Education. "The more content they are taught early on, the more they learn and the better they perform on later achievement tests."3

No Child Left Behind identifies the core subjects as English, reading or language arts, mathematics, science, foreign languages, civics, government, economics, arts, history and geography.14 This expanded list more accurately reflects the demands of 21st century workplaces and communities. For example, in a global economy, a foreign language, economics and geography are "new basics" for functioning effectively.

In a knowledge economy, core subjects continue to be relevant and they continue to open doors to opportunity. Recently, for example, researchers Anthony Carnevale and Donna Desrochers of the Educational Testing Service identified geometry as the benchmark course for students intending to work in well-paid, blue-collar jobs and low-skilled jobs and algebra II as the benchmark course for students aspiring to highly paid professional jobs or well-paid, white-collar jobs.15

Over the past decade, states and school districts have strengthened their focus on core subjects by developing academic content standards. Standards are a positive development in that they spell out clearly what students should know and be able to do. Schools must now make sure these standards are aligned with assessments. Measures and systems of accountability are only effective if they truly assess what people value.

**Emphasize Learning Skills**

To cope with the demands of the 21st century, people need to know more than core subjects. They need to know how to use their knowledge and skills — by thinking critically, applying knowledge to new situations, analyzing information, comprehending new ideas, communicating, collaborating, solving problems, making decisions. Philosopher John Dewey believed "the aim of education is to enable individuals to continue their education. ... The object and reward of learning is continued capacity for growth."

Of course, these higher-level thinking skills, or learning skills, are not new, but they are increasingly important in workplaces and community life. In its 1991 report, *What Work Requires of Schools*, the U.S. Secretary of Labor's

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**Learning Skills**

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<th>Information and Communication skills</th>
<th>Information and Media Literacy skills</th>
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<tr>
<td>Analyzing, accessing, managing, integrating, evaluating and creating information in a variety of forms and media. Understanding the role of media in society.</td>
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<th>Communication skills</th>
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<td>Understanding, managing and creating effective oral, written and multimedia communication in a variety of forms and contexts.</td>
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<th>Critical Thinking and Systems Thinking</th>
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<td>Exercising sound reasoning in understanding and making complex choices, understanding the interconnections among systems.</td>
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<th>Problem Identification, Formulation and Solution</th>
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<td>Ability to frame, analyze and solve problems.</td>
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<th>Creativity and Intellectual Curiosity</th>
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<td>Developing, implementing and communicating new ideas to others, staying open and responsive to new and diverse perspectives.</td>
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<th>Interpersonal and Collaborative Skills</th>
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<td>Demonstrating teamwork and leadership; adapting to varied roles and responsibilities; working productively with others; exercising empathy; respecting diverse perspectives.</td>
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<th>Self-Direction</th>
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<td>Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another.</td>
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<th>Accountability and Adaptability</th>
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<tr>
<td>Exercising personal responsibility and flexibility in personal, workplace and community contexts; setting and meeting high standards and goals for one's self and others; tolerating ambiguity.</td>
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<th>Social Responsibility</th>
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<tr>
<td>Acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace and community contexts.</td>
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Adapted from the work of the American Library Association,16 Association of College and Research Libraries,17 The Big6,18 Center for Media Literacy,19 Educational Testing Service,20 National Skill Standards Board,21 North Central Regional Educational Laboratory's enGauge,22 and the Secretary's Commission on Achieving Necessary Skills (SCANS).23

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Commission on Achieving Necessary Skills (SCANS) identified these kinds of skills, as well as the "personal qualities" of responsibility, self-esteem, sociability, self-management and integrity/honesty. Many states and school districts already incorporate learning skills into their standards and assessments for core subjects, but the Partnership and many employers and educators believe schools should emphasize them strategically and comprehensively.

Learning skills are cognitive skills that the Partnership defines in three broad categories:
- Information and communication;
- Thinking and problem solving; and
- Interpersonal and self-directional skills.

Learning skills enable people to acquire new knowledge and skills, connect new information to existing knowledge, analyze, develop habits of learning and work with others to use information, among other skills. (For more details on learning skills, see the chart on page 9.)

These “knowing how to learn” skills provide both flexibility and security in an era characterized by constant change. People who can learn new information, new software programs or new ways of doing things, for example, have much better prospects in the world than people who cannot. Business leaders want employees who can continually update their skills, communicate effectively and work independently to get things done. In its publication, Why Business Cares About Education, the Business Coalition for Education Reform noted: “Today’s economy is vastly different from fifty years ago, fueled now by brains rather than brawn. In order to survive, businesses need individuals who possess a wide range of high-level skills and abilities, such as critical thinking, problem solving, teamwork, and decision-making skills.”

Studies show the proportion of the labor force employed in occupations that make extensive use of interactive and analytic cognitive skills has increased substantially. One recent study conducted over a 40-year period found that more and more jobs demand workers who do more than routine work.

Learning skills are equally valuable outside the workplace. Making intelligent consumer choices, raising children, participating in civic affairs, evaluating media perspectives — all of these endeavors require people to access and assess information to solve problems, act constructively and make decisions. The world in which we live is increasingly sophisticated, multifaceted and nuanced. People need high-level learning skills to act, respond, learn and adjust to ever-changing circumstances. As the world grows increasingly complex, success and prosperity will be linked to people’s ability to think, act, adapt and communicate creatively.

During the past decade, our nation came to the widespread realization that technology was the driving force in the economy, and increasingly important to most of our human endeavors.
All around us we see the information technology revolution in progress — in communications, business and commerce, how we educate and train our people, and how we manage our personal lives.
— U.S. Under Secretary of Commerce for Technology Phillip J. Bond

Use 21st century tools to develop learning skills
As this report makes clear, technology is and will continue to be a driving force in workplaces, communities and personal lives in the 21st century. “Technology helps prepare students for the workforce when they learn to use and apply applications used in the world of work.... Workforce skills are mastered with technology use. When content and strategies meet accepted education standards, research shows that technology increases mastery of vocational and workforce skills and helps prepare students for work when emphasized as a problem-solving tool (Cradler, 1994).”

In this environment, the need for technologically literate citizens and workers increases every year. Skilled people in the 21st century need to understand how to use technology tools. The Partnership defines these as information and communication technologies (ICT) tools. Current 21st century tools include computers, networking and other technologies, plus audio, video, and other
media and multimedia tools. These tools enable people to perform effectively at work and in their daily lives, by using such tools as spreadsheets for calculation, budgeting and building scenarios; graphic and multimedia programs for presentations; databases for research; and networks for communicating with others.

Students need to learn how to use 21st century tools beginning in elementary school to take full advantage of the vast array of research and multimedia resources, digital content and communications options available to them.

**The Importance of Integrating ICT Literacy**

Together, learning skills and 21st century tools — knowing how to use these tools to perform learning skills — represent ICT literacy. Many learning skills may have nothing to do with technology, such as communicating effectively in face-to-face social or workplace situations or juggling personal responsibilities. ICT literacy, on the other hand, means harnessing technology to perform learning skills, such as communicating effectively with presentation software or juggling personal responsibilities with a personal digital assistant. In these situations, technology enables people to perform.

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**ICT Literacy Framework of the Partnership for 21st Century Skills**

<table>
<thead>
<tr>
<th>Learning Skills +</th>
<th>21st Century tools =</th>
<th>ICT Literacy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thinking and Problem-Solving Skills</strong></td>
<td>Problem-solving tools (such as spreadsheets, decision support, design tools)</td>
<td>Using ICT to manage complexity, solve problems and think critically, creatively and systematically</td>
</tr>
<tr>
<td><strong>Information and Communication Skills</strong></td>
<td>Communication, information processing and research tools (such as word processing, e-mail, groupware, presentation, Web development, Internet search tools)</td>
<td>Using ICT to access, manage, integrate, evaluate, create and communicate information</td>
</tr>
<tr>
<td><strong>Interpersonal and Self-Direction Skills</strong></td>
<td>Personal development and productivity tools (such as e-learning, time management/calendar, collaboration tools)</td>
<td>Using ICT to enhance productivity and personal development</td>
</tr>
</tbody>
</table>

Teach and learn in a 21st century context

Good teachers have always helped students discover the value and relevance of new skills and knowledge. Because children now live in a world of almost unlimited streams of trivial and profound information, of enormous opportunity and difficult choices, helping students make vital practical, emotional and social connections to skill and content is more important than ever. To help students make these meaningful connections, teachers can create a 21st century context for learning by:

- Making content relevant to students' lives;
- Bringing the world into the classroom;
- Taking students out into the world;
- Creating opportunities for students to interact with each other, with teachers and with other knowledgeable adults in authentic learning experiences.

Teachers can use examples, applications and settings from students' lives, communities and modern workplaces to frame academic content. They can expand the classroom experience by bringing in outside experts from the community. They can use the community as a learning laboratory. Today, technology makes it possible to bring the world into the classroom and to get students out into the world with "virtual" outreach and excursions into the physical world. Technology also makes it possible to change the dynamic between students and teachers, allowing students to pursue topics in depth and, at times, become experts in charge of their own learning.

In these ways, students can see the connections between their schoolwork and their lives outside the classroom, now and in the future. These connections are critical to developing students' engagement, motivation and attitudes about learning. Moreover, research shows that this kind of contextual learning in rigorous school-to-career programs in Boston, New York, Philadelphia and other communities leads to positive results for students as well, including higher academic achievement, lower dropout rates, better attendance and better college preparation.

By teaching in a 21st century context, educators can create a balanced education that reflects both national concerns and local needs.

Here in New Jersey, we are making a coordinated effort by working together with educators, the business community, and leaders from around the state to build a better New Jersey, where students are trained for success, and where our companies have the tools and the workforce they need to lead the way in research, development, innovation and new technologies.

— Gov. James E. McGreevey, NJ

Signing 2003 legislation integrating technology with the state's core curriculum

Learning skills contribute to student achievement

The scores of students at Wayne Central High School near Rochester, N.Y., taking the New York regents exam in history increased dramatically in one year after the school reworked the history curriculum to follow the Big6™ information literacy principles: task identification, information seeking strategies, location and access, use of information, synthesis and evaluation. Before these learning skills were integrated, 58 percent of students passed the exam. A year later, after these skills were integrated, 91 percent passed.

For more information, visit www.big6.com.

Information literacy in Illinois

The Maine Township, Illinois High School District 207 has formally adopted information literacy goals and systematically integrated them into core academics in the high school. The school district developed curriculum and assessment rubrics based on the American Librarians Association's Toolkit to assist teachers and students in infusing benchmarks for managing information in all core subject classes.

By their senior year, students are expected to know how to formulate questions efficiently to meet the requirement of a problem, identify appropriate resources, analyze and organize identified resources, build arguments and problem solve based on the resources.

For more information, contact Jim Flanagan at jflanagan@maine207south.k12.il.us.
develop civic-minded citizens who were committed to the fundamental values and principles of American society.

This generation of Americans is no different. We want our schools to prepare students for the world. We expect the next generation to preserve and strengthen our democracy. Today, though, business and education leaders agree that some content is missing from state and local standards and requirements for most students. This new content represents essential knowledge for the 21st century global community, workplaces and lifestyles.

Schools need to increase their emphasis in three content areas.

1. **Global Awareness.** Americans live in increasingly diverse communities and many work for businesses involved in global commerce. Technology is obliterating geographic boundaries and time zones; collaboration and communication across these boundaries is now commonplace. In this environment, people need a deeper understanding of the thinking, motivations and actions of different cultures, countries and regions. Global awareness promotes understanding, tolerance and acceptance of ethnic, cultural, religious and personal differences as they play out in communities and workplaces. It also helps people work through the complexities of different points of view that spring from different parts of the world.

2. **Financial, economic and business literacy.** Both personally and professionally, people are responsible for making sophisticated economic and business choices that will affect their futures profoundly: “Will a college degree improve my earnings?” “Where should I invest my money?” “Is it smarter to buy or lease a car?” “Should I consolidate my debt with a home equity loan?” “Why save for retirement now?” These everyday choices can result in personal prosperity — or in poor financial decisions, debt or even bankruptcy. Yet most people receive no schooling in these topics. As a result, “the cumulative effect of millions of financially illiterate Americans, unable to meet financial goals for themselves and their families, has large-scale national implications,”44 according to the National Endowment for Financial Education®.

Similarly, most people enter workplaces after high school or college without even a rudimentary understanding of the business processes, entrepreneurial spirit or economic forces that shape their lives. “How does my performance affect my company’s success?” “How can I support and contribute to my organization’s goals?” “What value do I add to the enterprise?” “Can I evaluate a proposal

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**ICT Literacy**

In 2004, the Partnership will release a report and leadership tools on ICT literacy. Knowing how to use 21st century tools to perform learning skills comprises ICT literacy. Learning skills are not a novel concept in education — but using modern tools to teach and assess them is a new approach. Recognizing the importance of technology literacy, No Child Left Behind requires that students be proficient in it by the eighth grade.

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**Boosting Ninth-grade Results with 21st Century Skills**

Houston County High School, a Blue Ribbon school in Warner Robins, Ga., features an innovative Ninth Grade Academy to help ease the transition to high school. Ninth graders enroll in a semester-long elective, High School 101 is a course that emphasizes 21st century skills, such as time management, decision making, and diversity and social tolerance. Students develop computer and Internet research skills as they use online resources to hone their study and test-taking techniques. They also focus on building an electronic portfolio of their work that will support them, just as these skills do, throughout their high school careers.

Houston County has made a major commitment to providing 21st century tools for its learning community, including wireless mobile computer labs that move from classroom to classroom to provide technology resources where needed. For example, in ninth-grade geometry classes, teachers use math visualization tools to help students make the essential connection between graphical representations and numerical equations. Teachers use results from electronic testing equipment to establish math tutorials and identify weaknesses.

For more information, visit **www.hcbe.net/presentation.htm**
and determine if it is a good business opportunity?" "Will this person be a good fit on my team?" Again, understanding these business issues can help people move ahead or fall behind in their careers. Financial, economic and business literacy will help people better manage their personal finances and contribute more productively in workplaces.

3. Civic literacy. The United States needs informed, responsible citizens to participate in the political process. Today, fewer and fewer Americans are exercising their civic rights and responsibilities; just 51 percent of the voting age population turned out to vote in the 2000 presidential election, according to the Federal Election Commission. Civic literacy can help students understand, analyze and participate in government and in the community, both globally and locally. Citizens should make decisions that reflect an understanding of historic implications, the role of leaders and a broader sense of political awareness.

Schools do not necessarily have to create new courses to incorporate this 21st century content into their classrooms. Rather, they can infuse this content into core subjects or use it in contextual learning experiences.

Other new content may be relevant in states and communities
State and local education leaders may work with business and community leaders to develop their own new content areas to reflect community, industry or regional economic development needs. Some communities are making this move already, convening educators, employers and public officials to engage in dialogues about community challenges and opportunities. Content areas such as the humanities, character education, and the visual and performing arts are among those that many communities believe are essential to a quality education.

From these collaborations, community leaders are working together to focus education programs and teacher professional development on local business and industry needs.

For example, some school districts offer school-to-career experiences in high school academies or programs in health care and medicine; math, science and engineering; manufacturing; robotics; biotechnology; and communications and the arts. Students learn core subjects through the lens of business contexts, settings and applications. In the best of these programs, students and their teachers have opportunities to learn about workplaces through visits, work experiences and collaboration with businesspeople.

Use 21st century assessments that measure 21st century skills
Improving student achievement has resulted in a national focus on assessment. Standardized tests are here to stay. As countless observers have noted, "What gets measured gets taught." In light of this reality, the Partnership has three overarching points to make

21st century assessments yield results
Launched in 2000 by an industry-education coalition, the Gary and Jerri-Ann Jacobs High Tech Middle and High Charter Schools in Napa, Calif., incorporate three design principles: personalization, adult world connection and a common intellectual mission. The schools feature performance-based assessments, daily shared planning time for staff, state-of-the-art technical facilities for project-based learning, internships for all students and close links to high-tech workplaces.

High school students do much of their best learning outside of school. Through community internships and projects, they collaborate with adults on work that has meaning well beyond a graded course. They routinely confront unpredictable problems and situations. They develop intellectual perspectives that cut across subject areas, mingling chemistry with civics or mathematics with the arts. And they form working relationships with adults, who model real-world problem solving and standards for excellence. This 21st century learning pays off on standardized assessments as well. For both 2000–01 and 2001–02, High Tech High ranked 10 on a scale of 1 to 10 in California on the Stanford 9 assessment.

For more information visit www.hightechhigh.org
CIVITAS is a curriculum framework designed to revitalize civic education in schools nationwide and foster a renaissance in civic thinking, learning and action. It sets forth national goals for a civic education curriculum, primarily for K–12 public and private schools but with extended applications in communities and in higher education, specifying the knowledge and skills citizens need to perform their roles in democracy.

As part of its social studies program, the Allentown (Pa.) School District has implemented and continues to develop a curriculum package based on the Center for Civic Education’s School Violence Prevention Demonstration Program. The curriculum package is benchmarked with state standards in civics, literature, math, reading and writing for elementary students. Plans are to create a K–12 program as well. This interdisciplinary strategy to integrate civics literacy into the core curriculum also supports students’ critical thinking skills, information literacy and problem-solving skills as they work through simulations of real-world problems in a project-based environment. The Center for Civic Education designed the original framework for this program in 1999 to promote ways in which civic education can be used as a strategy to prevent violence in school settings.

For more information, visit www.civiced.org/civitasexec.html or www.civiced.org/yoder_strategies.pdf.

about assessments and accountability:

- Standardized tests must measure both core subjects and 21st century skills. We must measure what we value—or it won’t be taught.

- Standardized tests must be balanced appropriately with classroom assessments to measure the full range of the students’ skills in a timely way.

- Classroom assessments must be strengthened and integrated with the instructional process to reinforce learning, provide immediate feedback and help students learn core subjects and 21st century skills.

As pervasive as assessment seems to be today, it remains an emerging and challenging field that demands further study and innovation. For example, as important as they are, standardized tests can measure only a few of the critical skills and knowledge that we hope our students will learn. Standardized tests alone do not provide the immediate diagnostic information that teachers, parents and students need to make decisions in the classroom or improve learning in real time.

Similarly, while education research literature documents the success of classroom assessment in improving student achievement, these assessments typically are not valid or reliable for broad comparisons across classrooms or schools. Effective classroom assessments integrate classroom teaching and learning, going beyond tests at the end of a lesson and providing immediate feedback to teachers and students on performance. Project-based assessments, for example, feature such characteristics as real-life contexts, everyday problems, the application of content to solve problems and the use of appropriate technologies. Teachers can specify the criteria for success through rubric development and make them known to students before the assessment.

Further, while employers and educators alike value learning skills, schools are not measuring them either on standardized tests or in classroom assessments.

Clearly, we must tackle these assessment issues now—or we risk the same kind of gap between how students learn and how they are tested as we have already between how students live and how they learn. For example, “there is increasing evidence that tests that require students to produce written responses on paper understi-

**Global awareness in a 21st century context**

As a lead teacher for the International Education and Resource Network (iEARN), Kristi Rennebohm Franz created the Schools Outfitting Schools (SOS) curriculum as a first step to developing an ongoing learning community connecting at her school, Sunnyside Elementary School in eastern Washington, and an Afghan elementary school. To raise money for school supplies for their Afghani counterparts, Kristi’s first and second graders honed their math, language arts and technology skills by giving presentations, creating promotional materials and tracking donations. What’s more, they developed greater global and cultural awareness by relating their efforts to current events and corresponding with students at their sister school.

The White House and the U.S. Department of Education highlighted SOS as an exemplary program in the Friendship through Education Consortium.

For more information, visit [www.iearn.org/afghan](http://www.iearn.org/afghan)

**Examples of new industry, local content**

The American Film Institute (AFI) worked with educators in Montgomery County (Md.) Public Schools to develop an educational guide to screen literacy, which is defined as the ability to read and write for the screens of computer, television, cinema and the Internet. Then AFI piloted a Screen Education Initiative, using an experiential pedagogy that combines state standards, academic curriculum and real-life professional evaluation and feedback, in six Los Angeles public schools.

The Pittsburgh Technology Council, a trade group with 1,500 members, offers several programs to help local schools prepare students for the future. For example, a partnership with a local high school exposes students — and teachers — to robotic technologies, digital logic, computer applications, technical writing and drawing, all integrated into core subjects.
MILE GUIDE for 21st Century Skills

MILESTONES for Improving Learning and Education
The 21st Century Skills MILE Guide

Creating a new model of learning

The 21st Century Skills MILE Guide can help any state, district or school answer some critical questions about how they are preparing students to meet the challenges of the new millennium:

✓ What are the changes necessary in our current model of education to best prepare students for the 21st century?
✓ Is your local system of education incorporating 21st century skills into learning?
✓ What criteria should be used to measure your progress?

The 21st Century Skills MILE Guide was created by the Partnership for 21st Century Skills to allow educators and administrators to measure the progress of their schools in defining, teaching and assessing 21st century skills. This hands-on tool helps schools integrate 21st century skills with basic skills for a stronger, more effective curriculum that successfully prepares today's students for tomorrow's workplace.

The 21st Century Skills MILE Guide can help your district:

✓ Set benchmarks and goals. The MILE Guide allows administrators and teachers to identify current profiles, establish goals and measure their progress.

✓ Apply for grants. The MILE Guide helps schools identify objectives as they seek funding and apply for grants.

✓ Determine funding priorities. Education leaders also can use the MILE Guide to determine where to allocate funds to fill gaps and improve their overall progress towards a 21st century model of learning.

✓ Create assessment tools.

The MILE Guide was designed for use by states, districts and schools. It enables teachers and administrators to assess where their schools stand in implementing 21st century skills, and to identify specific strategies for improvement. The flexibility and adaptability of the guide is the key to its success, allowing states to adapt the Guide and set policy standards.

Nine Steps
to build momentum

✓ Embrace a powerful vision of public education that includes 21st century skills.
✓ Align leadership, management and resources with educational goals.
✓ Use this tool to assess where schools are now.
✓ Develop priorities for 21st century skills.
✓ Develop a professional development plan for 21st century skills.
✓ Make sure students have equitable access to a 21st century education.
✓ Begin developing assessments to measure student progress in 21st century skills.
✓ Collaborate with outside partners.
✓ Plan collectively and strategically for the future.

Why Use the Guide?

States, districts, schools and education leaders must continue to focus on adopting a new model of learning for the 21st century. We must build on the current framework of core subjects and assessment to create an effective overall education strategy that equips students with the 21st century skills they will need to succeed in the modern workplace.
## Core Subjects

Students master core subjects.

### 21st Century Context

Instruction includes some content in a contemporary context.

### 21st Century Content

There is little content available outside traditional core subject areas.

### Learning Skills

Learning skills, which include higher order thinking, communication skills, self-direction, collaboration, initiative and creative thinking, are occasionally included in educational objectives primarily through curriculum and teaching strategies.

### Learning Tools

Students regularly use traditional tools.

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## Transitional Stage

### Core Subjects

Students master core subjects with some 21st century content and context.

### 21st Century Context

Instruction includes a significant amount of content in a contemporary context.

### 21st Century Content

There is some content available and used outside traditional core subject areas, including global awareness and civic and business literacy.

### Learning Skills

Learning skills often are included in educational objectives and teaching strategies.

### Learning Tools

Students occasionally use 21st century tools.

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## Early Stage

### Core Subjects

Students master core subjects in a contemporary context.

### 21st Century Context

Instruction always includes content in a contemporary context through the incorporation of relevant examples, applications and settings.

### 21st Century Content

Extensive contemporary content is available and used by students, including global awareness, civic and business literacy.

### Learning Skills

Learning skills are occasionally integrated into content.

### Learning Tools

Students occasionally use 21st century tools.

Students can fully integrate core subjects and 21st century skills. Students can use learning skills and 21st century tools to fully understand material in a current context. That allows them to function effectively in personal, community and workplace environments. Students have a solid foundation in content with the ability to apply it in interdisciplinary studies. Students have the skills to learn how to learn and to apply learning skills continually. Students also have an ability to use the traditional and 21st century tools available and know how to use 21st century content in a 21st century context. Students also have the ability to integrate 21st century content into substantive areas.
### Assessment

Academic success is focused on the mastery of core subject content.

Teaching focuses on student mastery of core subject knowledge and improving student performance.

Students, teachers and parents rarely collaborate to monitor student progress.

Assessments are pencil-and-paper-based and few assessments use technology.

Students begin to be assessed on their understanding and application of learning skills.

Assessment is more frequent.

Most teachers use classroom assessments to measure the effective application and integration of learning skills and 21st century tools.

Teachers begin to use student assessment results to improve teaching efficacy.

Students, teachers and parents often collaborate to monitor student progress in achieving learning goals and use assessment to evaluate long-term student progress.

Some assessments use technology but most assessments continue to be pencil-and-paper-based.

All assessment is learner-centered, formative, context-specific, ongoing and rooted in teaching strategies.

All teachers use classroom assessments that demonstrate evidence of student performance in core subjects and 21st century skills.

All teachers share with parents and students the information needed to monitor student progress in achieving learning goals.

Students, teachers and parents always collaborate to monitor student progress in achieving learning goals and use assessment to evaluate long-term student progress.

Most assessments use technology and record student performance as a means of providing feedback over time.

### Pedagogy

The teacher acts as a subject matter expert, a role model for teaching.

Teachers occasionally use adaptable and flexible teaching strategies.

Teachers occasionally integrate learning skills when teaching content.

10% or more of teachers integrate the use of 21st century tools into their curriculum.

The teacher acts as a subject matter expert, a facilitator for information and a role model for both teaching and learning.

Teachers often use adaptable and flexible teaching strategies that integrate 21st century skills.

Teachers frequently integrate learning skills when teaching content.

50% or more of teachers integrate the use of 21st century tools into their curriculum.

Teachers act as facilitators, resources and partners for teaching and learning.

All teachers use adaptable and flexible teaching and learning strategies that integrate 21st century skills.

All teachers act as role models in the application and use of 21st century skills.

Professional development supports the application of 21st century skills in teaching and learning strategies and classroom management practices.

All teachers access professional development through 21st century tools when applicable.

All teachers use professional development to reinforce their content competency and integrate 21st century skills.

### Professional Development

Professional development primarily supports content knowledge and administrative processes.

Professional development occasionally integrates the application of learning skills into teaching strategies.

10% or more of professional development is accessed through the use of technology.

Some teachers use professional development to build a high level of competency in their content area.

Professional development often integrates the application of learning skills into teaching strategies.

Professional development occasionally integrates the application of contemporary context and content into teaching strategies.

50% or more of professional development is accessed through the use of 21st century tools.

Most teachers use 21st century skills to work on advanced certifications or credentialing.

### Vision

Administrators create visions for student achievement that focus on the mastery of content.

Administrators emphasize the importance of learning skills as a successful strategy to demonstrate proficiency in content areas.

Few administrators promote a vision that incorporates the integration of 21st century tools into the curriculum.

Some administrators include the integration of 21st century skills as part of their overall vision for student achievement.

Some administrators facilitate and direct the programs and creation of assessment, professional development and work environments that encourage the integration of 21st century skills into the curriculum.

All administrators include the integration of 21st century skills as part of their overall vision for student achievement and act as role models for such integration.

All administrators promote, facilitate and direct stakeholders to develop broad and inclusive plans for curriculum, resources and operations that integrate 21st century skills into every aspect of learning, teaching and administrating.

### Equitable Educational Opportunity

Most schools and districts have technology plans that provide access to 21st century tools.

All schools and districts have implemented 21st century tools and have started to integrate 21st century skills.

50% or more of students have access to environments that advance 21st century skills.

Educational goals, teaching strategies and assessments reflect all of the needs of a diverse student population.

21st century tools are equitably distributed and there is access through homes, community centers, libraries and after-school programs.

100% of students have access to environments that advance 21st century skills.
### Planning & Allocating Resources

Technology planning primarily addresses infrastructure and equipment requirements. Resource planning rarely addresses educational objectives. Educational and administrative planning requirements are not aligned with technology planning. Few student and teacher performance metrics are linked to resource management decisions.

Educational planning and overall enterprise planning are occasionally aligned with technology planning. Resource planning adequately and substantively addresses and funds educational objectives. Resource allocation and management planning frequently incorporate student and teacher performance metrics.

District resource allocation and infrastructure plans are structured to provide students, parents, teachers and administrators with seamless access to 21st century tools and technology in school, at home and any other place where learning activities are envisioned.

There is a process for handling technology support, problems are addressed within 24 hours and technology is refreshed every three to four years.

All district services and operations are connected and there is seamless integration of departments.

### Infrastructure & System Integration

System planning is focused on the acquisition of technology and traditional tools. Few services or operations are connected and there is significant overlap in workload. Few teachers and administrators plan for technology use to supplement classroom resources. Technology support is erratic and takes several weeks for requests to be met. Technology is rarely updated and individual technology needs are not consistently met.

System planning has some focus on the integration of 21st century tools into educational strategies. Some services and operations are connected and there is minimal overlap in workload. Some teachers and administrators integrate the use of 21st century tools to supplement classroom resources. Technology support is available on a regular basis and problems are handled within a few days. Technology is refreshed every five to seven years.

### Knowledge & Skills

Administrators demonstrate effective use of traditional management techniques and traditional tools. Administrators rarely demonstrate effective use of technology in management of their schools or districts or use data-driven decision-making. Few administrators are proficient in their use of technology in the application of creating curriculum, assessment and alignment of standards.

Administrators begin to use innovative management techniques and 21st century tools. Many administrators are proficient in the use of 21st century tools in the application of creating curriculum, assessment and alignment of standards. Administrators occasionally demonstrate effective use of 21st century tools in the management of their school or district or use data-driven decision-making.

### Policymaking

Educational policymaking focuses on content mastery and administrative processes. Funding allocation supports and encourages content mastery. Some curriculum and educational objectives, including state standards, are aligned with assessment. Some educational objectives are focused on content mastery and include learning skills. Licensure of educators and accreditation of teacher education institutions focus on pedagogy and mastery of content areas.

Policymaking focuses on the integration of learning skills and 21st century tools into content. Funding allocation supports and encourages the integration of learning skills and 21st century tools into content. Many curriculum and educational objectives, including assessment, are aligned with state standards. Many educational objectives include 21st century skills. Licensure of educators and accreditation of teacher education institutions focus on newer teaching strategies, learning skills and 21st century tools.

### Accountability

Schools and districts are evaluated on student achievement in core subjects. Administrators are evaluated based on their administrative abilities, including creating effective policies and procedures that meet district goals, needs and budgets. Some districts are evaluated on their professional development programs and the creation of effective support processes for teachers and staff.

Many districts are evaluated on student achievement through the integration of learning skills and 21st century tools into core subjects. Administrators are evaluated on their administrative effectiveness and begin to be evaluated on the incorporation of 21st century skills into district curricula, the effectiveness and the streamlining of administrative processes and the development of long-term planning. Many states and districts are evaluated on their professional development programs and the creation of effective support processes for teachers and staff.

All schools and districts are evaluated on student achievement of 21st century skills in every aspect of teaching and learning. All administrators, schools and districts are evaluated based on the systemic incorporation of 21st century skills and the efficiency and productivity of educational programs. All districts are evaluated on their professional development programs, which include 21st century skills and the creation of effective support processes for teachers and staff.
### Parents
Parents are apprised of their child’s mastery of core subjects and occasionally meet with teachers to evaluate their child’s progress. Schools and districts use traditional tools, such as newsletters and meetings, to facilitate dialogue among parents and teachers.

Parents work with teachers to evaluate their child’s progress and to help demonstrate the implementation of learning skills and 21st century tools.

Some schools and districts use 21st century tools to facilitate dialogue among parents, teachers, and students and have ongoing systems in place for parent-school dialogue.

Parents, with support of the school system and community programs, occasionally work toward their own mastery of 21st century tools.

Parents, students, and teachers collaborate to enable each child to obtain an education that includes the mastery of core subjects and 21st century skills.

Schools and districts frequently use 21st century tools to facilitate dialogue among parents, teachers, and students.

Most parents have a mastery of 21st century tools and work towards improving their skills with support of the school system, community groups, and student leadership.

### Community
Community groups, youth organizations, community service providers, and local public agencies provide resources, facilities, and opportunities that benefit both students and the community.

Schools and districts occasionally work together with community and youth organizations.

Some students participate in community programs that help them apply 21st century tools to their own learning.

Some schools provide students with after-school access to technology.

Formal relationships between schools and community organizations begin to extend the school into the community and the community into the school.

Community programs incorporate learning skills and 21st century tools as part of student development, leadership, and learning initiatives.

Many students participate in community programs that help them master 21st century skills.

Many schools provide the students with after-school access to 21st century tools.

Community programs support learner mastery of 21st century skills and coordinate with schools to promote strategies that reinforce 21st century skills.

Schools provide students and the community with after-school opportunities to develop 21st century skills.

### Higher Education & Teacher Preparation
K–12 and higher education occasionally work together to prepare students for success in higher education but rarely include 21st century skills.

Research is focused on teaching and learning and is rarely shared with K–12 stakeholders.

Schools of education focus on preparing future teachers who demonstrate content competency in their subject areas.

10% or more of students in schools of education have ongoing mentoring with experienced K–12 classroom teachers and administrators.

K–12 schools and higher education programs often work together to address student preparation for success in higher education and include the application of 21st century skills.

Research is focused on 21st century skills and results are occasionally shared with K–12 schools.

Many teacher preparation programs have partnerships to promote the alignment of curriculum and standards to K–12 education strategies and assessments.

Schools of education begin to focus on preparing future teachers who are proficient in 21st century skills.

50% or more of students in the schools of education have ongoing mentoring with experienced K–12 classroom teachers, and the mentoring programs include a focus on 21st century skills.

K–12 schools and higher education programs regularly work together to prepare students for college, including the integration of content and 21st century skills.

Research focuses on teaching and learning with the integration of 21st century skills and results are always shared with K–12 schools.

All teacher preparation programs work to promote the alignment of their programs to K–12 education strategies with 21st century skills.

All teacher preparation programs graduate teachers who are proficient in their content area and 21st century skills.

100% of students in teacher preparation programs have ongoing mentoring with experienced K–12 classroom teachers and administrators, and programs integrate 21st century skills.

### Content Providers
Content providers support core subject mastery and K–12 leaders look to them as a source for traditional learning tools.

Educators look to content providers to align primary and supplementary resources to core academic standards.

Educators look to content providers to correlate resources to standards as required by state and local education agencies.

Content providers work with K–12 leaders to design 21st century tools.

Content providers create some content and resources that include learning skills and incorporate 21st century tools.

Content providers work with K–12 leaders to embed 21st century skills into all new content and resources.

Content providers create content and resources that include standards with 21st century skills.

Education leaders work with content providers to develop aligned resources, assessments and curriculum integrated with the appropriate 21st century tools and educational systems.

### Business
K–12 and private-sector partners rarely work together to address student preparation for success in the workplace and higher education.

Few K–12 students are mentored in the development of workplace skills or have access to internships and other programs that provide 21st century context.

Businesses support education and encourage programs that implement technology.

K–12 and private-sector partners occasionally work together to address student preparation for success in the workplace and higher education, including a mastery of 21st century skills.

Some K–12 students are mentored in the development of workplace skills and/or have access to internships and other programs that provide interaction with business.

Businesses support education and begin to encourage programs that promote 21st century skills.

Businesses, community and education leaders regularly discuss the skills needed for workplace and higher education success.
How to use the MILE Guide

The Partnership for 21st Century Skills' MILE Guide is a tool to help gauge a school's effectiveness in integrating 21st century skills into the learning process. Your school may fall within one category based on certain indicators and in another based on others. Such mixed readings are expected because every school is unique. The MILE Guide allows any school, district, or state, no matter what its budget, priorities or current technology profile, to better understand where it is today and to better plan for its future goals.

1. Focus on each of the categories across the top of the guide: Learning & Teaching, Leading & Managing, or Partnering, and the categories beneath them.

2. Under the selected category, find the level (early stage, transitional or 21st century) that best describes your school's efforts. (It's possible that your school may fall between two levels.)

3. After finding where your school falls, compare your school's program components with those in the 21st century level, which describes the ideal scenario.

4. Use your findings to start discussions with staff, administrators, technology directors, school board members and community leaders about improving your school's plans for 21st century skills.

MILE Guide

Glossary of terms

- **Basic skills**: the skills of reading, writing and numeracy; the traditional goal of education.

- **Core subjects**: core academic subject matter. Which subjects are viewed as core is generally left to the determination of states or local districts. No Child Left Behind identifies the following subjects as core subjects: English, reading or language arts, math, science, foreign language, civics, government, economics, arts, history and geography.

- **Information and communication technologies (ICT) literacy**: competency in enacting learning skills via the application of 21st century learning tools.

- **Learning skills**: process-oriented cognitive skills, here defined as the combination of information/communication, thinking/problem solving and interpersonal/self-direction skills.

- **Literacy**: the integration of a knowledge base (e.g. a core subject) and the appropriate cognitive and technical skills, that, when acquired, enable an individual to function effectively in a specific context.

- **Traditional learning tools**: the tools traditionally employed in the teaching of basic skills and core subjects (e.g., chalkboards, pencils, typewriters, books, xerographic machines).

- **21st century content**: additional subject matter knowledge required to function effectively in the personal, community and workplace environments of the 21st century.

- **21st century context**: teaching through the use of relevant real-world examples, applications and settings to frame academic content for students, enabling them to see the connection between their studies and the world in which they live.

- **21st century tools**: the full integration of core subjects with learning skills, learning tools and 21st century content as taught in 21st century contexts.

- **21st century learning tools**: information and communications technologies, such as computers, networking and other digital and non-digital computing technologies, as well as audio, video and other media tools.

Six elements of 21st century learning

- **Emphasize core subjects**.
- **Emphasize learning skills**.
- **Use 21st century tools to develop learning skills**.
- **Teach and learn in a 21st century context**.
- **Teach and learn new 21st century content**.
- **Use 21st century assessments that measure core subjects and 21st century skills**.
The Partnership for 21st Century Skills is a unique public-private organization formed in 2002 to create a successful model of learning for this millennium that incorporates 21st century skills into our system of education.

MEMBERS
AOLTW Foundation
Apple Computer, Inc.
Cable in the Classroom
Cisco Systems, Inc.
Dell Computer Corporation
Microsoft Corporation
National Education Association
SAP

KEY PARTNERS
U.S. Department of Education
Appalachian Technology in Education Consortium

STRATEGIC PARTNERS
Consortium for School Networking
ISTE
SETDA
Tech Corps

Partnership for 21st Century Skills
1341 G Street, NW
Suite 1100
Washington, DC 20005
202.393.2260

www.21stcenturyskills.org
The program aims to increase the number of teachers who can integrate information technology basic skills into their K–12 curriculum, improve the quality of teacher preparation for informational technology courses through professional development; and create mechanisms through which curriculum can be changed to meet the needs of industry.

At the Bergen Academy for Advancement of Science and Technology (AAST) in New Jersey, one of seven industry sector-focused academies within the Bergen County Technical Schools system, computer studies form an integral part of the science department, which also includes mathematics, physics, biology and chemistry. As a high-technology magnet school, AAST requires four years of math, three years each of chemistry, biology and physics, and one year of technology as part of the core curriculum for graduation. Electives within the technology strand include such diverse offerings as computer-aided design, optoelectronics, telecommunications, robotics and instrumental analysis. Other Bergen County academies specialize in business and computer technology, engineering and design, medical science, visual arts and graphic communication, power and transportation, and culinary arts.

For more information, visit:
www.AFI.edu.
www.PGHtech.org.
www.bergen.org/AAST/about/index.shtml

Technology may give schools the ability to create broader and smarter assessments that can provide accurate, timely measurements of student proficiency. When aligned with standards and curriculum such assessments can be a powerful tool to improve teaching and learning. The CEO Forum on Education and Technology encouraged alignment of standards, assessments and accountability with technology and data analysis.

To be sure, developing technology-driven assessments for a 21st century world demands research, flexibility and financial commitments from the public and private sectors, including higher education, schools of education, K–12 education, test developers and business. But decreasing costs for hardware, networks and delivery make this linchpin of a 21st century education more possible every day.

Clearly, we must tackle these assessment issues now — or we risk the same kind of gap between how students learn and how they are tested as we have already between how students live and how they learn.

mate the performance of students who are accustomed to writing with computers," says researcher Mike Russell of Boston College.56

Technology holds the promise of helping to solve some of the challenges of assessments today. Already, 12 states and the District of Columbia are administering computer-based assessments in the 2002–03 school year. Six of these tests are pilots. Of the states with computer-based tests, five report that they designed the exams partially to meet requirements of No Child Left Behind, which requires annual testing of students in English and math in grades three through eight and once in high school. Florida and Oklahoma are planning computer-based testing pilots for the 2003–04 school year.57 Digital scoring systems may dramatically increase the speed with which results are available and reduce the costs and time required for human scorers. Test-taking and test results may be nearly simultaneous.
State education leaders are beginning to understand the importance of ICT literacy to their educational agendas. However, policy approaches to integrating these skills into classroom learning vary. Some states incorporate ICT literacy into their core academic standards, others include it in curriculum guidelines. Few, if any states, however, are assessing these skills in their accountability measures.

The examples here illustrate how some states are moving in the right direction to integrate 21st century skills into the curriculum. This is not a comprehensive or exemplary list; rather, it is a sampling of possibilities for education leaders to consider.

**ALABAMA**

www.T4Alabama.org

T4 Alabama, a project for sixth- to 12th-grade students, addresses staff development and technology infusion. A semester-long T4 class trains students with the technical and collaborative skills necessary to partner with one of their teachers to improve their learning. Each student/teacher partnership creates a technology-infused lesson plan aligned to district or state curriculum standards. Student graduates of this course provide the ongoing technology support lacking in many schools. T4 Alabama involves more than 50 schools in the state.

**ILLINOIS**

www.CCSD15.NET/AboutDistrict15/StudentsAcquire21stCenturySkills.html

In Illinois, each section of academic standards includes an “Application of Learning” section, which details the applied learning skills needed for mastery of academic standards and benchmarks. As noted on the state department of education’s Web site, “Through Applications of Learning, students demonstrate and deepen their understanding of basic knowledge and skills. These applied learning skills cross academic disciplines and reinforce the important learning of the disciplines. The ability to use these skills will greatly influence students’ success in school, in the workplace and in the community.” The categories for the Applications of Learning are as follows:

**Solving problems**
- Recognize and investigate problems; formulate and propose solutions supported by reason and evidence.

**Communicating**
- Express and interpret information and ideas.

**Using technology**
- Use appropriate instruments, electronic equipment, computers and networks to access information, process ideas and communicate results.

**Working on teams**
- Learn and contribute productively as individuals and as members of groups.

**Making connections**
- Recognize and apply connections of important information and ideas within and among learning areas.

**NORTH DAKOTA**

www.dpi.state.nd.us/standard/content/tech.pdf

A team of library and technology specialists, assisted by representatives from the department of public instruction, recently developed the library/technology literacy standards for North Dakota. The standards were based on reviewing the standards work of these organizations:

- American Association of School Librarians (AASL)
- Association for Educational Communications and Technology (AECT)
- International Society for Technology in Education (ISTE)

The team also reviewed relevant content standards from all of the states as well as various research process models, such as The Big6™ by Eisenberg and Berkowitz.

The standards reflect the Partnership's view that students must develop the ability to access, evaluate and use a range of information sources in combination with adequate technology knowledge and skills to become critical thinkers and lifelong users of information. The standards define the knowledge and skills students need to be information literate, with the ultimate goal of students learning with information and technology, not learning about information and technology. Further supporting the Partnership's belief in integrating these skills with core subjects, the board advocates that library and technology specialists collaborate with other educators to integrate the standards into the curricula of academic content areas.

These five library/technology standards are developed through benchmarks, examples of specific knowledge and examples of activities for three grade ranges — K–4, 5–8 and 9–12.

**OKLAHOMA**

www.sde.state.ok.us/home/defaultie.html

In 2002, the state board of education adopted Priority Academic Student Skills (PASS), a set of four cross-disciplinary skills standards, including those for information literacy and instructional technology.
Based on the information literacy guidelines of the American Association of School Librarians, the PASS standards for information literacy reflect the view that the ability to find and use information is basic to student learning and that these standards are to be taught as an integral part of the curriculum in science, social studies, language arts, reading and so forth. The board of education recommends that classroom teachers and media specialists provide opportunities for students to use information literacy skills in completing class assignments.

PASS standards in instructional technology were created using the International Society for Technology in Education (ISTE) National Educational Technology Standards (NETS). The Partnership supports the position taken by the board of education in integrating these skills within the context of core subjects. As the board's Web site notes, "These standards should not be viewed as stand-alone standards for technology, but as technology that facilitates teaching and learning across the entire curriculum."

Pennsylvania

Pennsylvania's reading, writing, speaking and listening standards reflect the unique aspects of the processes that students use to learn and make sense of their world. As stated in the introduction to the standards, "Students do not read 'reading'; they read about history, science, mathematics and other content areas as well as about topics for their interest and entertainment.

Similarly, students do not write 'writing'; they use written words to express their knowledge and ideas and to inform or entertain others."

Because of their cross-disciplinary nature, reading, writing, speaking and listening standards are used by all teachers in Pennsylvania, regardless of subject or grade. Not surprisingly, these standards reflect many of the learning skills identified by the Partnership. Here is an excerpt from the standards for Grade 5:

**USE MEDIA FOR LEARNING PURPOSES**

- Compare information received on television with that received on radio or in newspapers.
- Access information on the Internet.
- Discuss the reliability of information received on Internet sources.
- Explain how film can represent either accurate versions or fictional versions of the same event.
- Explain the role of advertisers in the media.
- Use a variety of images and sounds to create an effective presentation on a topic.

Texas

In Texas, ICT literacy is comparable to Technology Applications literacy. Technology Applications is a required enrichment curriculum specified in law that focuses on the teaching, learning and integration of digital technology skills across the curriculum at all grade levels. The Technology Applications curriculum was built on the premise that students acquire Technology Applications knowledge and skills in a continuum beginning at the elementary level and continuing through the secondary level. Technology Applications standards were developed and adopted for grades K–12. The Technology Applications Texas Essential Knowledge and Skills (TEKS) describe what students should know and be able to do using technology.

Utah

The board of education has developed core curriculum standards in educational technology “to equip students with technology knowledge and skills necessary to successfully live, learn, and work in the 21st century.” The objectives are intended not only to teach marketable technology skills but also to apply technology across the curriculum. Consequently, the board advocates that this core be integrated with the core curriculum, not isolated from it.

Furthermore, to help curriculum and assessment developers as well as classroom teachers seeking guidance for teaching subject matter, the board of education also developed guidelines for life skills as part of its state curriculum guidelines, as follows:

- Lifelong learning
- Complex thinking
- Effective communication
- Collaboration
- Responsible citizenship
- Employability
- Character development/ethics

General Adoption of Technology Standards

This link shows the states that have adopted, adapted or referenced the ISTE NETS standards for educational technology:

http://cnets.iste.org/pdf/States_using_NETS_10_09_02.pdf
The Metropolitan School District of Lawrence Township (Ind.) recognized the need to develop a human resource infrastructure to promote inclusion of 21st century skills in its schools. To support this process, the district hired a full-time director of professional development and an internal initiative coordinator and trained 40 master teachers to serve as digital age literacy leaders and coaches. In addition, the district created the framework for an online learning environment, a professional development council and a new teacher orientation program.

For more information, visit www.msdlt.k12.in.us

Sharing resources for professional development

The Technology Applications Teacher Network, a collaborative project among the 20 Texas Education Service Centers and the Texas Education Agency provides Texas educators with professional development and resources to integrate technology into the classroom. The project includes professional development academies and online support. Professional development modules focus on integration in grades K-8 and development of advanced technology skills taught in the context of core curriculum content in grades 9-12. The first academies are planned for fall 2003. An objective of this effort is to share resources that are available through education, business and the community that can support educators in gaining the adopted State Board for Educator Certification (SBEC) Technology Applications educator standards.

For more information, visit www.tea.state.tx.us/technology/ta

Part III

Implementing 21st Century Skills: Nine Steps to Build Momentum

Preparing students for the 21st century calls for collective action on many fronts. This report is about getting started. Leaders in education, business and the public sector have been discussing the need for a 21st century education model for at least a decade — but we still have much to accomplish. Now is the time to begin. Here is a strategy for building momentum:

- Make sure students have equitable access to a 21st century education.
- Begin developing assessments to measure student progress in 21st century skills.
- Collaborate with outside partners.
- Plan collectively and strategically for the future.

1. Embrace a powerful vision of public education that includes 21st century skills. National, state and local leaders can articulate the growing urgency for a vision of education that prepares students for work and life in a knowledge society. The combined wisdom of research, best practices and insights from educators, employers and policymakers points to a vision of education that honors core subjects and integrates

Reshaping professional development for the 21st century

The Metropolitan School District of Lawrence Township (Ind.) recognized the need to develop a human resource infrastructure to promote inclusion of 21st century skills in its schools. To support this process, the district hired a full-time director of professional development and an internal initiative coordinator and trained 40 master teachers to serve as digital age literacy leaders and coaches. In addition, the district created the framework for an online learning environment, a professional development council and a new teacher orientation program.

For more information, visit www.msdlt.k12.in.us
learning skills and 21st century tools, context, content and assessments. This education model is comprehensive, strategic and foresighted, and it will help the nation fulfill the promise of No Child Left Behind.

2. ALIGN LEADERSHIP, MANAGEMENT AND RESOURCES WITH EDUCATIONAL GOALS. Leaders and managers set the tone for action. Policymakers, superintendents and school administrators can promote 21st century education by committing to incorporating 21st century skills in standards and assessments, investing in professional development and technology, and allocating adequate resources to ensure equitable access to 21st century tools. They also can develop their own proficiency in 21st century tools.

3. USE THIS TOOL TO ASSESS WHERE SCHOOLS ARE NOW. Education leaders can use the MILE Guide for 21st Century Skills in this report to gauge their schools' current capacity for preparing students to succeed. Many schools will discover that they already have begun the journey by focusing on core subjects, incorporating learning skills and technology into classroom expectations, providing teachers and administrators with relevant professional development, or collaborating in meaningful ways with employers and other partners, for example. These existing approaches give schools leverage to move forward more aggressively and develop benchmarks to measure progress.

4. DEVELOP PRIORITIES FOR 21ST CENTURY SKILLS. The MILE Guide will help education leaders pinpoint their strengths and weaknesses. From this self-assessment, schools can focus on the gaps between current realities and their vision for the future: Which 21st century skills do schools need to focus on? What are the short- and long-term priorities?

5. DEVELOP A PROFESSIONAL DEVELOPMENT PLAN FOR 21ST CENTURY SKILLS. To promote 21st century learning, teachers need to be competent in 21st century skills. They need to use instructional strategies that reflect current research, modern contexts to engage students in learning and classroom assessments that effectively measure what students are learning and how they are learning it. Professional development is critical if teachers are to model lifelong learning. States and school districts also must commit the resources and analysis necessary to guarantee that a teaching degree and license actually represent the skills necessary to teach in this century.

6. MAKE SURE STUDENTS HAVE EQUITABLE ACCESS TO A 21ST CENTURY EDUCATION. The power of core subjects and 21st century skills to make a difference in student learning

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**LAPTOPS HELP BRIDGE THE DIGITAL DIVIDE**

When it was time for the Henrico County School District in Richmond, Va., to upgrade its hardware, Superintendent Mark Edwards decided to leap into the 21st century by brokering a landmark deal to lease more than 24,000 laptop computers, one for every student and teacher in both middle and high schools. In a district that covers urban and rural areas, and one in which one-third of students have no access to technology at home, the district's initiative bridges some of the divide. The district also developed software that allows students to use technology for classroom activities and assignments and stay in contact with their teachers through the campus-wide wireless network. Students can work collaboratively with up-to-the-minute information constantly at their disposal.

A major element of the initiative has been a commitment to professional development and technical support. Teachers participate in curriculum writing workshops, peer mentoring opportunities and summer institutes and can access training online and through CDs and videotapes. Every school has full-time trainers and technical support personnel who give both students and teachers 24/7 support. The district has been able to pay for this $21.7 million initiative from its operating budget, with some support from federal technology grants.

For more information, visit www.henrico.k12.va.us/
is tempered by the fact that many students do not yet have access to them. All students need highly qualified, effective teachers and regular, reliable access to modern technology. Education leaders and outside partners must be especially vigilant about providing underserved students with equitable access to these learning essentials.

7. Begin developing assessments to measure student progress in 21st century skills. Assessments drive instruction, so assessments must measure 21st-century skills. States and school districts can work with testing companies to develop standardized assessments that incorporate and measure acquisition of 21st-century skills. School districts, schools and educators can develop effective classroom assessments for 21st-century skills as well.

8. Collaborate with outside partners. Parents, community organizations, higher education, schools of education in colleges and universities, employers and content providers all have important contributions to make to schools. Education leaders need to reach out to these partners and work with them to improve education.

Parents can be full partners with educators in helping children learn and their schools improve. Community organizations, such as youth-serving groups, libraries and public service agencies, can promote education in extended learning opportunities outside of school. Colleges and universities can develop formal relationships with K-12 schools to build a seamless transition for students into higher education. They also can enrich the research base in hot topics such as effective instructional practices and methodologies. Schools of education can prepare future teachers with a solid foundation in core subjects, a repertoire of effective instructional strategies and competence in 21st-century skills. Employers can work with education leaders and classroom teachers to identify workforce needs and provide learning opportunities for students and educators alike. They can support

Overcoming limits for students with disabilities

NO LIMIT! (New Outcomes: Learning Improvement in Mathematics Integrating Technology) is an Enhancing Education Through Technology grant administered by the Office of the Superintendent of Public Instruction in Washington. The project is beginning its third year of implementation.

The NO LIMIT! project contains an element for addressing the needs of learning disabled students. Under the directorship of Ann Black of the Washington State Special Education Technology Center, the program is designed to:

- Improve reading and writing skills, mathematics and problem solving and higher-order thinking skills among learning-disabled students
- Supplement math curricula and develop classroom learning scaffolds that help learning disabled students become more successful in mathematics, reading, writing and numerous 21st-century skills
- Promote development of learning disabled students as technology mentors who are able to collaborate effectively with their peers and with adults.

For more information, visit http://www.cwu.edu/~setc/lomath/proj_desc.html

Community access

In a small, rural community, the Mercedes Independent School District in Texas is maximizing the use of its facilities as both formal schools and community centers with two opportunities for community members to access both technology and training.

With leadership from Superintendent Jesus Gandara, Mercedes ISD designed and built a Community Tech Dome. The 3,600-square-foot facility houses more than 300 computers and a wireless lab for distance learning in a bright, fun and open architectural design. During the day, the multi-use space is used by the junior high school as classrooms and computer labs. After school and on Saturdays, community members take advantage of Internet access, workforce development classes and enrichment activities.

During the summer, Mercedes ISD keeps five of its eight campuses open. Although school funding is sufficient to operate one school for those students required to attend summer school, Mercedes received a competitive grant (21st Century Community Learning Center support from the U.S. Department of Education) to operate year-round out-of-school programming on school grounds. Mercedes will use its partnership with NetDay AmeriCorps to staff many of the summer programs. The services are free to all Mercedes community residents.

For more information, visit http://www.mercedes.k12.tx.us/
adequate funding for schools to support 21st century skills. Content providers, such as textbook companies and test developers, can embed 21st century skills into their products.

9. Plan collectively and strategically for the future. Education, business and community leaders can use the MILE Guide for 21st Century Skills to understand where they are and where they need to go to transition to 21st century schools and classrooms. Key stakeholders can work collaboratively to articulate a vision that reflects current realities and unique state and local workforce and community needs.

The Partnership makes these recommendations with a deep respect for the challenges facing many states and schools today. Budgets are tight. Demands are intense. Student needs are profound. The challenge of ensuring equitable access to teaching and learning tools for all students remains formidable. At the same time, there is widespread public support for education and an abiding belief in the tradition that Americans must prepare young people to succeed.

We believe that schools can use the provisions of No Child Left Behind to remedy some of these challenges. That said, there is much that other stakeholders can do — and already are doing — to bridge the achievement gap and the digital divide.

The Partnership for 21st Century Skills looks forward to contributing to this effort. We intend to continue to engage in conversations with students, educators, employers, community members and policymakers about education in the 21st century. We will continue to develop reports and tools to help education leaders jumpstart teaching and learning in their schools. As you get started, we encourage you visit our Web site to share your stories and best practices. Collectively, we can learn and take action for generations to come.

This is a dynamic, exciting time for everyone involved in education today. There is a tremendous opportunity to consolidate standards, assessments and accountability; core subjects and 21st century skills; technology and professional development investments; and teaching and learning into a unified vision of a 21st century education. With all of these pieces aligned and integrated into a coherent whole, the nation’s 20-year effort to improve student achievement will come together like a vibrant mosaic. This is a holistic vision of education that is worth our collective efforts.

Technology literacy for administrators

The International Society for Technology in Education (ISTE) has formulated and adopted technology standards for school administrators in six areas:

- Leadership and vision
- Learning and teaching
- Productivity and professional practice
- Support, management and operations
- Assessment and evaluation
- Social, legal and ethical issues

For more information, visit www.iste.org.

Experiential learning through community partnerships

In close partnership with school activities and learning standards, Boston-based Citizen Schools aims to meet 21st century demands on students by bolstering after-school learning focused on writing, data analysis and oral communication through apprenticeships, explorations, homework time and team-building activities. The vision of the program is to use schools after hours, on weekends and in the summer for experiential learning opportunities that link schools to a larger network.

The Citizen School curriculum stands on four pedagogical pillars aiming to strengthen academic skills, develop personal leadership skills, facilitate access to resources and build community connections. The schools are based in cities across the United States, working with roughly 1,000 students annually.

For more information, visit www.citizenschools.org

Built-in assessments spur students to learn

At Charlestown High School in Boston (Mass.), veteran math teacher Leo Carey has been successful in teaching a rigorous curriculum on technology skills in a self-paced format using real-world context. Assessments built in to the curriculum require students to master concepts before moving on to the next lesson. Many students are non-native English speakers, so the visuals in the curriculum help them learn concepts more quickly. They can review materials in other languages as well, making it more accessible to bilingual students. According to Carey, "A higher percentage of students stay engaged for a longer period of time."

For more information, visit http://boston.k12.ma.us/teach/technology/
Improving education for the 21st century is a communitywide endeavor. Education leaders who are ready to get started will want to coordinate their efforts and work strategically with outside partners. Specific steps that people at many levels can take as part of a comprehensive effort are listed below.

**IN THE PUBLIC SECTOR**

**Next steps for federal policymakers**
- Encourage states and school districts to develop a vision for learning in the 21st century.
- Use No Child Left Behind to encourage states and school districts to incorporate ICT literacy into education.
- Increase the use of research and development on the integration of 21st century education.
- Align the vision and focus of 21st century skills in K-12 schools with after-school, military, workforce, and research and development programs.
- Provide incentives to encourage schools to incorporate 21st century skills.

**Next steps for local policymakers**
- Convene education leaders and employers to begin or continue to talk about preparing workers and citizens for the 21st century.
- Continue to work with schools and businesses to promote excellence in teaching and learning. Emphasize core subjects and 21st century skills.
- Align standards and assessments to 21st century skills.
- Support professional development in 21st century skills for teachers and administrators.
- Support funding for schools to enable them to foster 21st century learning.

**Next steps for state policymakers**
- Make sure standards incorporate 21st century skills.
- Develop assessments that align with 21st century standards.

**Next steps for parents and families**
- Increase your family’s use and understanding of technology tools and learning skills.
- Use your personal or professional skills and contacts to help schools, businesses and community groups work together to improve student achievement.
- Urge schools to integrate ICT literacy into core subjects and develop new 21st century context, content and assessments.
- Partner with teachers to support your children’s development of 21st century skills.
- Support funding for schools to enable them to foster 21st century learning.

**IN THE PRIVATE SECTOR**

**Next steps for business**
- Reinforce the need for high-skilled, productive workers.
- Work with K-12 schools and higher education to articulate clearly the list of skills and attributes needed for the 21st century workforce.

**Assess your parent involvement**
The Parent Teacher Association has developed a self-assessment tool for schools to evaluate the quantity/quality of parent involvement, that could serve as a model for developing a 21st century skills assessment for teachers, schools and districts.

**For more information, visit www.pta.org**

**Assess your educational partnerships**
Go to [http://www.nelc.org/resources/foocusonresults.pdf](http://www.nelc.org/resources/foocusonresults.pdf) for guidelines for a self-assessment of how well your organization is doing in its educational partnerships.
IN EDUCATION

NEXT STEPS FOR K–12 EDUCATION LEADERS

- Examine local learning goals, curriculum, teaching tools, instructional practices and student assessments to make sure they are aligned in support of 21st century skills.
- Provide teachers and administrators with professional development that prepares them to teach 21st century skills.
- Increase your own ICT literacy.
- Provide staff access to 21st century tools.
- Improve assessments to measure 21st century skills.
- Increase teacher knowledge and use of classroom assessment methodologies.
- Seek funding to support 21st century skills.

NEXT STEPS FOR HIGHER EDUCATION

- Encourage K–12 schools to integrate 21st century skills into their college preparatory programs.
- Develop mentoring relationships with K–12 schools and community leaders.
- Develop ICT literacy among college and university students.
- Support schools of education financially and technologically at the same level as other college and university programs.

NEXT STEPS FOR SCHOOLS OF EDUCATION

- Foster a vision of a 21st century education.
- Develop programs that comprehensively prepare graduates to teach in the 21st century.
- Develop new pedagogical strategies that are based on research evidence and support 21st century skills.
- Teach prospective educators to use data to drive decisions.

NEXT STEPS FOR RESEARCHERS

- Study the impact on student achievement of integrating 21st century skills into K–12 schools.
- Develop teaching strategies to effectively teach 21st century skills.
- Create and test assessments that are aligned with 21st century skills.
- Study the best ways to educate, train and evaluate teachers in 21st century skills.

NEXT STEPS FOR YOUTH-SERVING ORGANIZATIONS

- Increase communication and collaboration with K–12 schools and parents to support teaching and learning for the 21st century.
- Integrate 21st century skills into technology programs supported by local, state or federal funding.

NEXT STEPS FOR CONTENT PROVIDERS

- Work collaboratively with educators to modernize content and assessments to reflect 21st century skills and technology.
- Integrate 21st century skills into core content and assessments.
- Develop content that incorporates the use of 21st century tools.

NEXT STEPS FOR PROFESSIONAL EDUCATIONAL ORGANIZATIONS

- Encourage your members or constituents to develop competence in 21st century skills.
- Offer professional development opportunities to your members or constituents.

ALIGNING STANDARDS, CURRICULUM AND ASSESSMENTS

The North Central Regional Educational Laboratory has developed a resource for educators working to align standards, curriculum and assessments at local, state and national levels.

For more information, visit http://www.ncrel.org/areas/issues/content/curriculum/cu300.htm
One of the most important aspects of the work of the Partnership for 21st Century Skills has been to build consensus among the education, business and policymaking communities on the importance of 21st century skills and to develop a common language for describing these skills. In pursuing these goals, the Partnership conducted an extensive outreach effort to a broad range of individuals and groups within the education community, including education experts, teachers, administrators, students, businesses, community groups, university faculty and researchers, underserved community representatives, after-school program representatives, and policymakers. Below is a description of our efforts in the first year.

Outreach at Conferences and Meetings
The Partnership presented its plan of work to solicit suggestions and feedback at a number of national conferences and meetings.

National School Boards Association Conference, Dallas, Texas Nov. 15, 2002
The Partnership held a briefing at the NSBA T+L convention. More than 600 invitations went out to leaders in the education community and others attending the NSBA conference. Approximately 50 people participated.

State Education Technology Directors Association Meeting, Washington, D.C. Dec. 8–10, 2002
The Partnership participated in this event with state educational technology directors from all 50 states to discuss technology literacy and 21st century skills.

The Partnership participated in panel discussions on ICT literacy.

Florida Education Technology Conference, Orlando, Fla. Feb. 4–6, 2003
The Partnership made a presentation to state education technology leaders at this conference.

The Partnership participated in this education conference and gathered input from education experts on 21st century skills and technology literacy.

The Partnership staff and two school district practitioners led a panel discussion on Defining and Promoting 21st Century Skills from Theory to Practice. Approximately 100 people attended this session.

In addition to presenting our work plan and preliminary findings at conferences and meetings, the Partnership convened education leaders to review our draft report and MILE Guide for 21st Century Skills at a two-day forum.

This forum was the Partnership's major event of the year to gather education community feedback on its work. The Partnership organized a national forum on 21st century skills and brought education experts together to discuss the definition, teaching and assessment of these skills. The group reviewed the draft MILE Guide and provided feedback on the MILE Guide and our draft report.

Participants
AEL, Inc. John Ross
ATED/CNAC Art Sheekey
Center for Media Literacy Tessa Jolls
Community Technology Development, Inc. Holly M. Carter
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Education Development Corporation Tony Streit
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Idaho State Department of Education Alyson Knox
ISTE Rich Mincer
Just Think Foundation Don Knezek
League for Innovation in the
Community College Elana Rosen
Learning Technology Center
Learning.com
Media Literacy Project
Metiri Group
Mindplay
National Business Education Association Mark Milliron
National Geographic Society Paul Resta
NCREL Mark Tullis
NetDay Renee Hobbs
North Central RITEC Cheryl Lemke
Northwest Educational Technology Laboratory Judith Bliss
Ohio SchoolNet Commission Chris Shearer
Online Learning.net Gil Valdez
Pima County School District Julie Evans
SETDA Kristin Ciesemier
Software Information Industry Association
Seymour Hanfling
Hassan Hijazi
Larry Fruth
Alan Arkatov
Linda Arzoumanian
Mary Ann Wolf
Karen Billings
Digital Education Leadership Conversation
Conference, Coral Gables, Fla. March 28, 2003

The Partnership presented its draft messages to state departments of education and school district chief information officers, chief technology officers and senior industry executives attending this conference.

Open meeting with national education groups, Washington, D.C. May 21, 2003


Outreach to organizations

The Partnership’s research and development effort has collected a great deal of information, resources and online tools via our Request for Information (RFI), posted on our Web site at www.21stcenturyskills.org.

Organizations submitting information

ABOTICS
Association of College & Research Libraries
Alabama Supercomputer Authority
Alliance for a Media Literate America
American Association of Colleges for Teacher Education
American Association of School Librarians, a division of the American Library Association
American Foundation for the Blind
Belhaven School, Linwood, N.J.
Benton Foundation, Center for Children and Technology
Bridges.com Inc.
Bristol Local School District, Bristolville, Ohio
California Learning Resource Network
California State University Long Beach
Camanche High School, Camanche, Iowa
Caribou High School, Caribou, Maine
CNA Corporation
The Cato Institute
Center for Media Literacy
Cognitive Concepts, Inc.
Colorado Power Libraries
CompTIA
Computer Literacy Project Survey
Computers for Education
Consortium for School Networking
Council of Chief State School Officers
Diagramix
Digital Promise
District of Columbia Public Schools
Durham Elementary School, Durham, Maine
Education Development Center, Inc.
Educational Testing Service
EduCatalyst
Etta J. Wilson Elementary School, Newark, Del.
Evans Newton Incorporated, Scottsdale, Ariz.
Federation of American Scientists
Florida Center for Instructional Technology
Fort Totten Public School District #30, Ft. Totten, N.D.
Generation Yes
Global SchoolNet
Hotmath, Inc.
iEARN-USA
Information Technology Association of America
Institute of Electrical and Electronics Engineers, Inc.
International Center for Leadership in Education
International Tech Ed Association
ISTE
League for Innovation in the Community College
Lee’s Summit North High School, Lee’s Summit, Mo.
Marco Polo Education Foundation
Media Literacy Project
MILE: Media and Information Literacy Exchange
Morino Institute
Morristown High School Library, Morristown, N.J.
Mt. Olive Public Schools, Budd Lake, N.J.
National Academy Foundation
National Assistive Technology Research Institute (NATRI)
National Business Education Association (NBEA)
National Center for Education Statistics (NCES)
National Geographic
National PTA
National Skill Standards Board
National Workforce Center for Emerging Technologies
North Central Regional Educational Laboratory (NCREL)
NetDay
New Technology Foundation
Ohio Educational Library Media Association
Oliver Wendell Holmes Library at Phillips Academy, Andover, Mass.
Orchard Hill Elementary School, Cedar Falls, Iowa
Pennsylvania State University
SAFARI Technologies, Inc.
School Library Media Programs

(with funding from Pew Charitable Trust)
Outreach to individuals and groups with expertise in 21st century skills

In addition to seeking input through the RFI, the Partnership conducted extensive outreach to education experts and organizations to solicit their expertise on 21st century skills.

Alliance for a Media Literate America
American Film Institute
American Forum for Global Education
American Association of School Librarians, a division of the American Library Association
Aspen Institute
Educational Testing Service's International ICT Literacy Panel
Center for Media Literacy
Metiri Group
Cognitive Concepts, Inc.
Computers for Education
Consortium for School Networking
Dr. Susan Curzon, Dean, University Library at CSU Northbridge
EduCatalyst
Education Development Center
Educational Testing Service
The Big6
Faculty at the Harvard Graduate School of Education
The Futures Channel
George Lucas Foundation
iEARN (International Education and Resource Network)
Information Technology Association of America
International Society for Technology in Education
International Technology Education Association
Lawrence Township Schools, Indianapolis, Ind.
Mid-Atlantic Regional Educational Laboratory
Mouse (Making Opportunities for Upgrading Schools and Education)
National Skill Standards Board
North Central Regional Educational Laboratory
NetDay
National Forum on Information Literacy
SchoolNet Inc.
Scott County Partnership, Scottsburg, Ind.
Software and Information Industry Association
State Educational Technology Directors Association
Tech Corps
The League for Innovation in the Community College

Focus groups research on this report and the MILE Guide

The Partnership organized focus groups in April and May 2003 to gather feedback on the draft MILE Guide from teachers, students, administrators, state educational technology directors, after-school program directors and others in the education community:

Lawrence Township, Ind. This group comprised primarily digital literacy coaches in the Lawrence Township Digital Age Literacy Program.

Underserved community groups. In this group, participant affiliations included classroom teachers, after-school programs, corporations and government agencies in the Washington, D.C. area.

Classroom teachers. This focus group convened K-12 public school teachers from around the United States who work with Cable in the Classroom to discuss both the report and MILE Guide.

State Educational Technology Directors Association/American Association of School Librarians, a division of the American Library Association. Members of the State Educational Technology Directors Association and the American Library Association from Florida, Ohio, Texas and Virginia participated.

National Education Association (NEA). The Partnership met with nine NEA board members, all of whom are classroom teachers, representing Alaska, Indiana, Iowa, Louisiana, Massachusetts, Nebraska, Oregon, Pennsylvania, and West Virginia.

Software and Information Industry Association. The Partnership met with a group of 25 software and information industry executives from the education technology field in California for a focus group on the Partnership's materials.

Students. The Partnership met with a diverse group of high school students at Cienega High School, Vail, Arizona, to discuss 21st century learning.

NetDay. The Partnership convened with a group of nine AmeriCorps members from Oakland and Santa Ana in California and the Rio Grande Valley in Texas and three AmeriCorps project directors to discuss implementation of 21st century skills in schools.
Appendix B

References


Education Development Center, Skills for the Twenty-First Century: Supporting Digital Literacy in the Classroom, 2002.
LEARNING FOR THE 21 ST C ENTURY


Appendix C

ENDNOTES


3 National Skill Standards Board, Using Skill Standards and Certifications in Workforce Investment Board Programs, 2002.


5 21st-Century Skills for 21st-Century Jobs, Executive Summary, p. 3.


7 Ibid., p. 6.

9 Provided by Dell.


14 No Child Left Behind, Title IX — General Provisions, Part A — Definitions.


19 Center for Media Literacy. CLM MediaLit Kit™ Available at http://www.medialit.org/bp_mk.html.


24 Ibid.


28 Ibid.


34 Center for Media Literacy. CLM MediaLit Kit™ Available at http://www.medialit.org/bp_mk.html.


39 North Central Regional Educational Laboratory and Cheryl Lemeke, 2003.


43 Rush, Benjamin. Of the Mode of Education Proper in a Republic, 1789.


45 Education and Training for the Information Technology Workforce: Report to Congress From the Secretary of Commerce, April 2003. p. 54.


51 Education and Training for the Information Technology Workforce: Report to Congress From the Secretary of Commerce, April 2003. p. 54.


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  Tech Corps

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- Learning.com
- Southern Regional Education Board

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