In June 1998, a group of educators, facilities planners, architects, government leaders, and interested citizens were invited by the U.S. Department of Education to discuss ways of planning and designing schools to best meet the needs of students and their communities. From that meeting came a set of six principles for designing better learning environments.

The six principles were affirmed at the Department of Education's National Symposium on School Design in October 1998 and endorsed by the American Institute of Architects; the American Association of School Administrators; the Council of Educational Facility Planners, International; and the Construction Managers Association of America.

The principles are predicated on three generally accepted conditions: learning is a lifelong process, design is always evolving, and resources are limited.

The principles are simple and straightforward. To meet the nation's needs for the twenty-first century, school learning environments should (1) enhance teaching and learning and accommodate the needs of all learners; (2) serve as a center of the community; (3) result from a planning and design process that involves all community interests; (4) provide for health, safety, and security; (5) make effective use of available resources; and (6) be flexible and adaptable.
DESIGN PRINCIPLE 1

The learning environment should enhance teaching and learning, and accommodate the needs of all learners.

Educational research makes it clear that the physical environment affects learning. School design can enhance—or hinder—academic achievement.

Most of the nation’s 94,000 public schools were designed for an educational model characterized by large-group, teacher-oriented instruction taking place in individual classrooms. However, current research and practice emphasize new educational models that are characterized by active student participation rather than passive listening and watching. New models include such strategies as cooperative, project-
based, and interdisciplinary learning. They require that students move about, work in groups of various sizes, and be active. The models place increased emphasis on learning styles and the special needs of each student.

Recent research also recognizes additional factors that affect learning. These include indoor air quality, occupant comfort, lighting, and classroom acoustics (Schneider 2002). For example, one well-known study indicates that students with high levels of classroom daylighting show improved math and reading test scores (Heschong Mahone Group 2002). Multiple studies indicate that physical comfort correlates positively to the ability to concentrate, student attendance rates, and teacher retention (Lackney 1999).

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Photos: (opposite page) Neil Alexander/Neilphoto.com, courtesy of Concordia LLC; (left) photo illustration based on photo provided courtesy of LCOR Incorporated; (below) Photodisc.
DESIGN PRINCIPLE 2

The learning environment should serve as a center of the community.

Successful schools strengthen a community’s sense of identity and coherence. Like a new version of the old town square, a school can serve as a community hub that teaches its occupants about collaboration and the common good.

In the past, most schools were built as stand-alone instructional facilities that restricted—rather than encouraged—community access. Their auditoriums, sports facilities, food service facilities, libraries, media centers, computer labs, and other specialized spaces were typically available to the community on only a limited basis. Tomorrow’s educational facilities must be designed to be more open and serve a variety of community needs.

At their best, schools that serve as centers of community should:

• Help meet a community’s leisure, recreational, and wellness needs
• Be accessible to people of all ages
• Encourage more active parental involvement in school activities. Establishing a school parent resource center, for example, sends a powerful message that parents are welcome and encouraged to take part in their children’s learning.
• Support relationships with local businesses that are productive to students and supportive of the local economy
• Promote participation by members of the community in a variety of ways, including mentorships, apprenticeships, and other learning opportunities based on work and service
• Contain shared public spaces that are accessible year round
• Be places where creative space configurations expand school use, where learning occurs after school, at night, and on weekends, and where school-to-school partnerships, links with businesses, and collaborations with higher education are encouraged and supported.

In fulfilling these roles, schools should manifest the high standard of design appropriate to public buildings. They need not be costly, but they should add a sense of beauty, interest, and permanence to the community. By capturing the noble character of public architecture, they should serve as a visible symbol of community pride.
DESIGN PRINCIPLE 3

The learning environment should result from a planning and design process that involves all community interests.

Faith in the effectiveness of collective problem solving lies at the very heart of this nation’s democratic system, which holds not only that people have a right to participate in making decisions that affect them, but that such participation actually improves the outcome of the decision-making process. Thus schools should be planned by the many people who will use them—including educators, parents, students, senior citizens, and members of civic and business organizations.

Widespread community participation enables consideration of community diversity. Communities by their very nature are diverse, reflecting such differences as age, culture, ethnicity, gender, socio-economic class, aspirations, and abilities. Varying viewpoints enrich the design process because they broaden the range of ideas and solutions considered.

Community participation creates a shared sense of purpose. When community members are given opportunities to take part in meaningful planning activities, their sense of commitment is strengthened. When they see themselves as visionaries, creators, and owners, they are more willing to work together to set goals, solve problems, and provide their schools with the ongoing support and financing necessary to make the schools succeed.

It is essential to set aside adequate time and resources to ensure widespread and fully informed participation in the planning process. It should take place either before or concurrently with the development of a facilities master plan, educational specifications, technology plan, and architectural plans.

Authenticity of involvement is perhaps the most important ingredient in the planning process. Too often the community perceives that it can only rubber stamp decisions already made by administrators, board members, or planners and architects. The old-style public hearing process—one or two public presentations of already-developed plans—can lead to frustration and apathy on the part of citizens who want to be involved. But authentic community engagement can result in a more extensive and creative set of ideas, more trust in public officials and government, a broader base of support and funding as the project moves forward, and a stronger sense of community for everyone involved.

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Photo: Courtesy of Concordia LLC.
DESIGN PRINCIPLE 4

The learning environment should provide for health, safety, and security.

Health and safety have always been top school priorities. During the past decade concern has intensified about a number of health and safety issues, including indoor air quality, campus crime, youth violence, substance abuse, and—more recently—terrorism.

At the most basic level, school designers must address environmental safeguards and meet applicable health and safety codes. Children—because of their smaller, developing bodies—are more sensitive to pollutants than are adults. For this reason, schools must pay special attention to air quality and the potential for children’s exposure to harmful substances that may occur in building materials, finishes, furnishings, and equipment.

To help ensure the highest reasonable standards of safety, school planning and design should incorporate the three concepts embodied in Crime Prevention Through Environmental Design, or CPTED: natural surveillance, natural access control, and territoriality.

The origins of CPTED are found in Jane Jacobs’ landmark work, *The Death and Life of Great American Cities* (Jacobs 1961), a book that enabled a whole generation of planners to understand the importance of porch-sitters, shopkeepers, walkers, and others who “look out” for one another in the community setting.

CPTED concepts for educational facilities are fully described in *Safe School Design, A Handbook for Educational Leaders: Applying the Principles of Crime*...
Prevention Through Environmental Design (Schneider et al. 2000).  

CPTED works particularly well for neighborhood schools, where people know each other by name, or where school use by outside organizations expands adult participation—and therefore supervision—at many levels. By strategically locating windows, entry access, and gathering places, school designers can foster safety and security by facilitating natural rather than electronic surveillance.

Of course, school safety and security require a change in behavioral norms and attitudes as well. A growing body of evidence suggests that behavior can be significantly influenced by the quality of the learning environment. Attractive, well-designed, and well-maintained facilities communicate respect for the people and activities housed within them and contribute to a positive school climate, good discipline, and productive learning (Schneider 2002).

The size of the student population and scale of school buildings also have a substantial effect on school safety. When schools and classrooms are small enough to allow teachers and students to form personal relationships, a sense of community is established that promotes a safe environment. By limiting the population of an individual school—or by providing spaces for smaller schools within larger ones—school designers can help maximize supervision and encourage healthy social interactions among students, teachers, administrators, and community users.

Schools that provide space for after-school programs can be safer schools, too. Since most student violence occurs between the hours of three and six p.m., after-school programs have become key components of violence prevention plans. Youth activities such as academic enrichment, sports programs, and arts and crafts provide healthy options for filling time and increasing the connection between students and their school.
DESIGN PRINCIPLE 5

The learning environment should make effective use of available resources.

Schools should be designed to take advantage of the fact that the physical environment can have a positive effect on the learning experience. One effective way to do this is to make the most of available resources.

For instance, schools that make optimal use of computers and current communications technology can most readily facilitate new methods of instruction—letting teachers become guides and coaches; allowing students to analyze, evaluate, and manipulate information; and permitting curriculums to be individualized.

Where possible, schools should allow specialized spaces—such as kitchens, mechanical rooms, and maintenance areas—to become three-dimensional textbooks, showcasing educational content and offering lessons in physics, mathematics, geometry, art, history, and science.

To help students understand the connection between the classroom and the workplace, resources outside the school can be used for extended learning. By partnering with community organizations, school boards can enlist such community resources as libraries, museums, zoos, parks, hospitals, and government buildings for extended learning.

“Effective use of available resources” also means efficient energy consumption. Schools are among the largest public consumers of energy in both their construction and operation and should be designed to make the most of existing natural resources. The U.S. Department of Energy estimates that at least $1.5 billion per year can be saved through modest energy conservation modifications in new and existing schools (EnergySmart Schools 2003).

“High performance schools”—those built with durable, environment-friendly materials and designed on the basis of life-cycle costs, rather than first cost—help reduce the use of nonrenewable resources. In addition, they are more productive places for teaching and learning, and save substantial amounts of money over the long run (Sustainable Buildings Industry Council 2001).
Schools can actively teach stewardship of environmental resources. A school that embodies stewardship through careful and conscious management of land, air, water, energy, and building materials teaches children that taking care of their community is important and that their actions have an impact on the world in which they live.

In addition, schools should be designed using the latest concepts of city planning and community design. The principles of smart growth call for neighborhood schools rather than large facilities on the edge of town that exacerbate sprawl and require extensive busing. More concentrated, pedestrian communities lead to more livable towns and cities.

Proper planning can magnify the potency and impact of a host of community resources. For example, co-locating healthcare programs in schools can significantly increase the quantity and frequency of medical care for children and adults alike. School facilities can be used for cultural enrichment at a fraction of what it would cost to duplicate the same types of spaces elsewhere. Such cultural events might include ethnic and community festivals, theater performances, art shows, and other activities that support, celebrate, and enhance a community’s cultural assets.

Existing schools should be renovated and preserved whenever possible, especially in cases where reuse preserves natural resources or valuable historic and cultural assets. Building reuse helps children and adults alike to embrace the social and cultural heritage of their community.

Change is a constant, and school facilities must be flexible enough to adapt. As community needs evolve, as new educational programs and strategies are developed, and as new technologies are incorporated into the teaching and learning process, the demands on schools are changing at an unprecedented rate.

The best school designs allow for spatial flexibility. Designers and decision makers cannot lock too firmly onto any single notion of “school” or to become wed to a fixed idea of what classrooms should be. Flexible, open structural systems that allow spaces to be reconfigured over time will best accommodate change (Brubaker et al. 1998). By evaluating and updating master plans and educational specifications at least once every five years, school districts can help ensure that their facilities will meet the needs of a changing world.