Chapter 7
Learning Spaces for All
Using Space and Physical Resources to Support All Students

CHAPTER GOAL

Understand how to design and use space and physical resources to support all students in learning together.

CHAPTER OBJECTIVES

1. Understand universal design and the principles of healthy learning environments.
2. Recognize school-wide methods of using and designing space.
3. Explore and identify classroom approaches to using space, technology, and resources to respond to students' learning styles and abilities.
4. Examine strategies for community-based learning experiences.

The first of the year is always hard and exciting all at once. We come into our classroom and look around at the bare walls and the boxes and boxes of materials. "How will the year go?" we wonder. We imagine the room filled with students. How do we arrange the physical environment of our classroom to promote effective teaching of diverse students? That's what this chapter is about. Let's first visit two schools that are working hard to develop positive learning environments.

A High School For Learning

We are impressed by the attractiveness of Santa Fe High School. Walking through the entrance, we see bright banners proclaiming WE ARE A LEARNING COMMUNITY in the commons area, a large open area at the building entrance. Part of this commons area is the cafeteria, which has movable tables that can be folded away as needed for community and extracurricular events. As we visit classrooms, we discover that many rooms are connected to encourage interdisciplinary teaching. Students are working at tables in groups; others are working at computers using software that converts text to spoken language. Another student, who does not read or write well, is working with a partner on a story, dictating it into a computer that converts speech to text. Teachers are organized in interdisciplinary teams—each team including science, social studies, language arts, art, and special education. Students are also divided: into "colleges" of some 200 students each, with whom the same team of teachers will work for all three years. There are no special education rooms in the school. A learning resource center is staffed by a teacher and a counselor and is available for any students at any time during the day. This is a fun room where students can study, get special help, take adapted tests, or just hang out.

This school seems like home We are struck by how warm Edwardo Elementary School feels. The office feels open and comfortable; secretaries welcome all who come in with a genuine smile, and the principal chats with children, teachers, and parents. We are particularly interested in the book projects displayed throughout the entrance hall, with students' artistic renderings or other representations of parts of books they have read. Classrooms, too, are filled with student work—not only on the walls but also hanging from ceilings. We also see all sorts of children—one in a wheelchair, another with a sign language interpreter. The student in the wheelchair has a communication device that speaks for her. Her friends are learning to use this device. Again, there are no special education classes in this school; special education teachers and paraprofessionals spend most of their time teaming with general education teachers in the classroom. We want to come visit again.

Environments have a big impact on our lives, and we put a lot of time and energy into arranging them. Yet so much of our teaching environment often feels given, unchangeable—a large, older high school building, a dreary classroom, inaccessible steps. Even so, we can always shape our environment as well as be shaped by it. Our goal is to structure the learning environment, to the degree possible, to support best practices in teaching and learning. What will make an environment most conducive to teaching diverse learners well together? What will enable us to use best practices in teaching and learning? What specific tools can we use to create effective inclusive learning environments? We will address these questions in this chapter.

Back Pack
Designing Classrooms

Classroom Architect. A great site where you can design a layout for your classroom.
classroom.4teachers.org/

Emint National Center from the University of Missouri has many resources for classroom design.
www.emints.org/ethemes/resources/S00001368.shtml

Boundless Playgrounds We thought you might enjoy seeing more about this work!!
www.boundlessplaygrounds.org/

The Learning Environment
A Tool for Learning and Growth

What is our learning environment? As teachers, we may automatically answer, "Our classroom, of course!" We suggest that our learning environment is much more. At minimum, our "extended classroom" encompasses (1) the school building and grounds, (2) the classroom, and (3) the community surrounding the school. If we think of our

learning environment in this way, we will find numerous ways to use these many places and spaces to structure learning. This chapter will discuss these learning environments in order. First, however, let's think in a more general way about what is needed for students of diverse abilities to learn together. Two interactive frameworks are helpful: (1) universal design and (2) guidelines for healthy environments. Let's discuss these.

Universal Design

Architects and other design professionals are using a new concept to inform the shaping and organization of space and resources—*universal design.* Like the concept of designing teaching for diversity, on which this book is based, universal design involves a conceptual revolution. In the past, environments and products have most often been designed to fit the physical characteristics of average human beings. In contrast, universal designers seek to develop "products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (Steinfeld, 1994). Here are a few examples:

- Ramps and automatic doors are helpful not only to people in wheelchairs but also to many other people who must struggle with stairs or heavy doors—shoppers with packages, parents pushing strollers, older people with canes.
- Talking software, originally developed for people with visual impairments, is being marketed for all people. In some technical devices the talking computer interfaces have increased productivity by some 25 percent.
- Recorded books, long used by blind people, are now commercially marketed for travelers; people who enjoy listening to books read aloud; and people with limited reading challenges, such as individuals with learning disabilities.

The Center[1] for Universal Design (Connell et al., 1997) developed seven principles for designing environments and products to take into account the full diversity of human abilities (Figure 7.1). These principles constitute a powerful set of statements that can help us evaluate our present teaching practices and the way that the learning environment either contributes to or detracts from effective teaching.

Universal design is being applied to some degree in the architectural design of schools, particularly with the explosion of technology. We can involve our students in answering the basic question: "How do we arrange our physical environment in ways that meet our needs and promote learning among students of different abilities, races, and cultures?"

The Principles of Universal Design

PRINCIPLE 1: EQUITABLE USE
The design is useful and marketable to people with diverse abilities.
1a. Provide the same means of use for all users: identical whenever possible, equivalent when not.
1b. Avoid segregating or stigmatizing any users.
1c. Provisions for privacy, security, and safety should be equally available to all users.
1d. Make the design appealing to all users.

PRINCIPLE 2: FLEXIBILITY IN USE
The design accommodates a wide range of individual preferences and abilities.
2a. Provide choice in methods of use.
2b. Accommodate right- or left-handed use.
2c. Facilitate the user's accuracy and precision.
2d. Provide adaptability to the user's pace.

PRINCIPLE 3: SIMPLE AND INTUITIVE USE
Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

3a. Eliminate unnecessary complexity.
3b. Make use consistent with user expectations and intuition.
3c. Accommodate a wide range of literacy and language skills.
3d. Arrange information consistent with importance.
3e. Provide effective prompting and feedback during and after task completion.

PRINCIPLE 4: PERCEPTIBLE INFORMATION
The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
4a. Use different modes (pictorial, verbal, tactile) to provide redundant presentation of essential information.
4b. Provide adequate contrast between essential information and its surroundings.
4c. Maximize "legibility" of essential information.
4d. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions).
4e. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.

PRINCIPLE 5: TOLERANCE FOR ERROR
The design minimizes hazards and the adverse consequences of accidental or unintended actions.
5a. Arrange elements to minimize hazards and errors: Most used elements should be most accessible; hazardous elements should be eliminated, isolated, or shielded.
5b. Provide warnings of hazards and errors.

5c. Provide fail-safe features.
5d. Discourage unconscious action in tasks that require vigilance.

PRINCIPLE 6: LOW PHYSICAL EFFORT
The design can be used efficiently and comfortably and with a minimum of fatigue.
6a. Allow user to maintain neutral body position.
6b. Use reasonable operating forces.
6c. Minimize repetitive actions.
6d. Minimize sustained physical effort.

PRINCIPLE 7: SIZE AND SPACE FOR APPROACH AND USE
Appropriate size and space is provided for approach, reach, manipulation, and use, regardless of user's body size, posture, or mobility.
7a. Provide a clear line of sight to important elements for any seated or standing user.
7b. Make reach to all components comfortable for any seated or standing user.
7c. Accommodate variations in hand and grip size.
7d. Provide adequate space for the use of assistive devices or personal assistance.

Source: Connell et al. (1997).

The figure below provides some ideas for using the principles of universal design to shape environments so that they are accessible and encouraging to all students, limiting the need for individual accommodations. Notice that the chart uses the three environments of school, classroom, and community in interaction with the three key areas around which we have structured this book—(1) academic learning, (2) social–emotional needs, and (3) physical–sensory abilities. This chart offers ideas to get you started as you plan your class at the beginning of the year.

Healthy Learning Environments

Architects say that "form follows function." In other words, if our environment is to be effective, it should be structured based on the functions that we want it to perform (Greenman, 1988; Meek, 1995). If we see our classroom as a place of control, the environment will be structured to control. If we see our classroom as a place of joy, fun, choice, and learning, the room will come bit by bit to look this way. If we seek to design inclusive learning environments, we also ensure that our environment promotes health and well-being; stimulates optimum intellectual, emotional, and physical functioning; and aids us in implementing best practices for teaching and learning. The figure below lists some guidelines drawn from literature on universal design, healthy environments, and school design. Let's look briefly at each guideline.

	SCHOOL	CLASSROOM	COMMUNITY
Academic	< Student work all over the building < Total school staff who see themselves as supporting student learning < Effective library and media center that is accessible to students and offers materials at many different levels < Computers in the media center that have talking software, speech to text, scanners, etc.	< Books and other resources for different ability levels < Talking computer software < Multiple tools to use to express learning—speech-to-text software, graphics, audiotapes < Sound amplification devices; FM receivers available as needed < Visual magnification devices available; large-print display and software for computers < Sign language offered as	< Mentors who come into the school and read or do investigations with students < Community organizations that host student learning activities < Accessible playgrounds and museums
Social–emotional	< Welcoming place—student and staff greeters < Parent and community volunteers < Supportive and caring culture < Cheerful building with work of students highlighted throughout	< Places to work together, or alone in privacy < Peer buddies < Circles of support < Student participation in organizing and decorating of room < Classrooms filled with student work	< Local places where businesspeople and community members welcome students < After-school mentors and circles < After-school programs involving community members and parents
Sensory–physical	< Wheelchair access < Clear signs using both words and pictures < Displays of student work that encourage looking, touching	< Talking software and input devices < Braille printout from computers < Places for movement in the class < Allowance for drink and food < Clear labels for materials in the class with picture cues < Spaces for wheelchair access	< Accessible playground equipment < Accessible public buildings and businesses

Guidelines for Healthy Learning Environments

1. Stimulate positive awareness of ourselves and our students.
2. Enhance our connections with nature, culture, and people.
3. Do us no physical harm.
4. Be beautiful and inviting.
5. Provide for meaningful, varying stimuli.
6. Encourage times of relaxation and privacy.
7. Balance constancy and flexibility.
8. Use resources flexibly for multiple purposes.

Stimulate Positive Awareness of Ourselves and Our Students. At best our school and class are tools through which students can become more aware of who they are—places of student self-expression where young people can better understand themselves. On any given day, students see their own products. When we visited Mitchell Elementary School to observe student-led conferences, one fourth grader spent an hour showing her work—literally walking through the classroom, showing her portfolio, hands-on lessons located on tables, her work on the walls, and hanging from the ceiling. This student clearly felt ownership of this classroom and saw expressions of her inner self all over the room.

Enhance Our Connections with Nature, Culture, and People. Our learning environment helps us develop multiple connections—with varied peoples, with cultural expressions, with nature. Our school is filled with the art, music, and literature of varied cultures—particularly those in our local area. In an inclusive school, our students connect with classmates from various cultural and socioeconomic backgrounds as well as with youngsters with disabilities.

Do Us No Physical Harm. It might seem almost too obvious to state, but we don't want our environment to hurt us. Unfortunately, this requirement is sometimes not met. In many older schools, buildings still contain lead or asbestos that can have negative effects on the well-being of children. Similarly, the neighborhoods in which some children live are physically unhealthy. If we work in such situations, we will face many challenges and will need to work hard in our own classroom and to interact with local community people to deal with these issues. In any classroom, however, it is our

responsibility to organize our space so it is as safe as possible.

Be Beautiful and Inviting. Carol Venolia (1988, p. 15) stated that "the creation and experience of beauty is immediate, whole, and healing. It enlivens our senses, warms our hearts, relaxes us, and puts us at one with the entire surroundings." A beautiful environment can help stimulate students and help promote a sense of safety and security (Greenman, 1988; Mann, 1997; Meek, 1995).

Provide for Meaningful, Varying Stimuli. We allow for multiple ways for students to be grouped and move about the classroom and school and draw on multiple intelligences to ensure that students have many ways to obtain information, express themselves, and learn. We establish locations where students can talk, be alone, read quietly, make noise, sit, run, and jump. We have a working space for projects involving the integration of literacy, art, music, dance, and drama.

Encourage Times of Relaxation and Privacy. Teachers and students need space and time for periodic relaxation and privacy, allowing students to regroup, to let their minds settle. Although this guideline may seem very difficult to implement in a crowded school, we can find ways if we are creative. Students need places to be alone—to think, read, or even cry.

Balance Constancy and Flexibility. The brain-based need for "relaxed alertness" (see Chapter 11) means that there is ongoing interaction between involvement in challenging activities and the ability to move away. In physical terms, it also means that we periodically change the environment—displaying new student work, shifting tables for a special project—but also maintain stability and predictability. The brain needs both novelty and security for learning—and our skill in providing both opportunities for stimulation and stability will help establish conditions for the linkages of academic learning, emotional calm, and community building.

Use Resources Flexibly for Multiple Purposes. Space and physical resources are often categorized as fulfilling one function, for example copy room and hall. However, if we are designing healthy environments, we realize that any space can be effectively used in multiple ways. Because resources are limited, such flexible and creative use of space has the effect of expanding our capacity. For example, some teachers assign each desk to one student

The problem is that these teachers really believe that such restrictive, punishing approaches are all that is possible, that creating a welcoming environment will not work for "their children." They think their students are too difficult, too disrespectful, and too challenging to function in a setting with choices and cooperative and active learning.

They do not realize that organizing restrictive environments to try to control student behavior actually exacerbates the situation. Human beings are social creatures. We cannot learn in silence. When students are isolated or removed from the classroom, this may control their behavior in the short-term but it does not teach them different ways of being. Students in such classes go into a fight or flight mode and cannot learn effectively. Their minds literally shut down; and they become angry and resentful and always find ways of expressing this.

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Bumps in the Road
Organizing For Control Rather Than Learning

Too often in schools, teachers and other educators focus more on controlling behavior of students rather than teaching them how to be responsible, how to learn, how to care for others. You see this in the way whole schools and classrooms are organized – places of control and restriction. Such schools and classrooms are most often the least inclusive. They don't meet the needs of children and children respond in kind, creating an ongoing battle between students and teaching staff.

What are the physical structures that are designed to control rather than teach. Here's some of what you will see:

1. ***Desks in rows***. The purpose for this organization is to focus on the teacher as the one 'in charge' and to keep the children quiet and discourage interaction, and to keep students at their seat. Typically in such classes students are not allowed to talk to one another, must raise their hand to move anywhere else in the room. Not surprisingly the teacher puts a great deal of energy into enforcing these rules so that there are constant commands to "Be quiet and work" or "get back in your seat and do your work".
2. ***Isolating students who are seen as problematic***. Again, rather than teaching students how to act and be responsible, in these classrooms teachers will isolate students. This is done several ways. A students desk may be placed on an outside row and turned so that it faces back away from all other students so that the he can see no one. The teacher's intent is to reduce opportunities for what are perceived as problematic interactions with other students. We've also seen classes in which teachers literally built barriers around a student. In one class, for example, a student with autism who had challenging behaviors had a desk surrounded by a bookcase and two 4 drawer file cabinets. Once again, the intent was to control behavior that was seen as problematic.
3. ***Places for 'bad students'.*** Often teachers in these types of classes will create

places that they put students who are bad. Often, of course, this place is sending them out of the class altogether to the principal's office.

The teachers themselves are so focused on others behavior that they have forgotten that the only behavior they can control is their own. The teacher is not modeling and teaching behaviors they want the student to learn.

It's also not surprising that these are not very inclusive teachers. Frequently, they are have the most suspensions, the most students sent to the principal's office, the most students referred to special education (in the hopes that they will leave their classroom).

What to do? First, we must consider if, in fact, we are such a teacher or have tendencies in this direction. Are we trying to control students behavior or teach them to be responsible people? If so, are we willing to really question our assumptions and beliefs and work in a different direction? That's the key, of course.

Second, if we are teaching with teachers who are in this mode, there is no doubt that their actions impact on our classroom and the culture of the entire school. At best, we can try to get to know these teachers, hear their concerns, and tell them strategies that we use and the results we get with students. We might even agree to take a student from that classroom with whom the teacher is having lots of trouble. When, as will be the case if we're using the approach articulated in this book, we are successful in working with the student, we may gain credibility with this teacher and may be able to help them learn different strategies.

The School

Creating a Welcoming Place for All

Trends in school design reflect our evolving images of school. In the early twentieth century, the idea that bigger is better—and more efficient—was dominant. That period was the time of the growth of large industries. It also was the time when many elementary schools were built to house more than 1,000 children and when high schools

were designed to dominate local neighborhoods. In these buildings desks were arranged in precise rows, often bolted to the floor (Meek, 1995). Today, however, our understanding of the connection between social interactions and learning has greatly shifted our thinking about how to design space. Let's survey the elements of a welcoming school.

A Welcoming Place to Be

We want to promote a spirit of community and common ownership rather than seeing the school as belonging only to the power structure. This spirit is communicated in the smallest matters. We display a lot of student work prominently on walls and in display cases. Artwork, essays, photographs of a class play or of community projects, and other student work reflect the cultural and ethnic diversity of the area. Colors are attractive and bright rather than institutional green, even in classrooms of older children. We post signs of welcome and encouragement throughout the building, many made by students. Our school office has comfortable chairs and an open, inviting atmosphere (Greenman, 1988; Meek, 1995).

Commons

A commons area may be located in a central area of the building with park benches, water fountains, and other amenities to encourage conversation and interaction. A commons gives students a place to gather before and after school and at lunch, and serves as a gathering point for groups. Schools often intentionally locate their commons next to the school administration office to convey a sense of openness, and administrators often interact informally with students and parents (Greenman, 1988; Meek, 1995).

School within a School

A smaller school size, optimally 100 to 200 students, can make a big difference in students' sense of community (Meek, 1995). Large high schools were designed to provide adequate numbers for many programs; increasingly, however, smaller schools are being built, or schools are being designed to allow the student body to be broken into smaller groups. Schools often seek to arrange space where these teachers

work together in flexible ways—linking classrooms in older buildings by doors or cutaways, placing offices between classrooms where teachers can work together, or fitting rooms with movable walls that allow teachers to combine their classes or work separately.

Parent and Community Center

It is very helpful to have a designated space where parents and community members can work, study, or just be while in the school. This space can be a separate room, or it can be part of an area such as the media center (library) or support staff offices.

Media Center/Library

In many ways, the media center is the heart of the school. In many schools media specialists run programs to help students learn the basics of word processing, using the Internet, and accessing information. In a school that focuses on a love of reading, there will be times of open circulation that children are free to come and browse through books on their own, with a class, or with a parent. Media specialists can also be a fount of useful information on ways to integrate computer use into the classrooms; on teacher- and child-friendly Internet sites to explore; and on books to use for any purpose, from a read aloud on a certain subject to literature circles.

Space and Inclusive Classes

Schools can send powerful messages about who belongs and who does not. The "special education class" or "resource room" is often down at the end of the hall. Students cycle in and out the speech therapist's office. Talk to almost any student who has been in these special places and they can tell you of the fear, dread, and embarrassment they feel. Jordan, a student who was placed in a special education room when he was in the fifth grade, was terribly ashamed and simply would not stay in the room. He wandered the halls to prevent his former classmates from seeing him in the special education room and making fun of him. He was eventually kicked out of several schools and sent to a special education center—where his fondest dream was to go to a "regular" high school.

In Whole Schooling we do not have special classes for students with labels. Rather, students are heterogeneously mixed in general education classes. Figure 7.4 contrasts uses of space in inclusive and segregated schools, classrooms, and communities.

WHOLE SCHOOLING	SEGREGATED
■ There are no special education, bilingual, or Title I classrooms. Specialists are housed as teams in offices. ■ Technology and "specials" are integrated into ongoing classroom instruction, and special and general education classroom teachers work together to integrate instruction.	■ The school has special classes for special education, bilingual, and Title I classes that are most often at the end of the hall. ■ Specialists' offices are separate from those of the rest of the school staff.
CLASSROOM	
■ Students work in groups at tables or clusters of desks; there is a hum of activity. ■ Groups of students include diverse ability levels, ethnic and cultural groups, genders. ■ Students' work covers the walls, hangs from the ceiling, is displayed outside the room. ■ Students are seen in many places—at desks and tables, sitting on the floor and on bean bags, out in the halls working in pairs. ■ Speech therapists, special education teachers, and other support staff come into the class and help with students. However, you can't tell who they are there to work with.	■ Desks are arranged in rows; some desks are at edge of room. ■ Students are grouped by ability levels as they engage in activities. ■ Students of color are most often in the lower-level ability groups. ■ Teacher-made bulletin boards abound with rules and lists of consequences for infractions. ■ Students sit at desks. The teacher attempts to ensure that they are quiet, in their seats, and working independently. ■ Some students leave periodically for special help, causing a good deal of coming and going. ■ Students with disabilities are not allowed to mix with other students, even at recess or lunch.
COMMUNITY	
■ Students frequently go on short or longer study trips into the community. ■ Local community organizations and individuals come into the school. ■ The school has an active community and parent center where local people organize their work in classrooms and student engagement in the community. ■ Students in the school are actively involved in studying local community issues.	■ Students stay in the school building all day, except when they go to the playground. There is little connection with the local community. ■ When students with disabilities finish school, they go to sheltered workshops and group homes.

When educators begin to learn about Whole Schooling, a frequent question is: "How much does it depend on money? Can only rich districts do this?" In schools that serve low-income people, particularly in cities, this question gets turned into one of space. "We already have thirty-five kids in a class," said the principal of a very segregated

middle school. “If we put kids with disabilities in these classes, we would have classes much too large.” However, when you begin to look at the data, these concerns do not hold true.

Let’s look at Georgetown High School as an example. The school is located in a poor but very racially diverse area. Some 30 percent of the students are African American, 30 percent Latino, and the rest are an even mix of whites from the Appalachian region and Asian Americans. In this school 40 teachers serve about 1,000 students. Of the teachers, 18 are “general education” teachers, each of whom has 35 students. The other 22 faculty members teach in segregated classrooms; they include 9 special education teachers,

Now let’s do a bit of math. If all teachers took all students, the teacher-to-student ratio would be 1:20, an amazing figure in this district. Although teachers would need new training to address student needs, this could work. Let’s consider another option. If 30 teachers were general education teachers and the other 10 were support teachers, the student teacher ratio would be 1:33—high, but still less than the present ratio. Each of the 10 support teachers could work with 3 general education teachers; in other words, each general education teacher would have the equivalent of a support specialist working with the class one-third of the time. It becomes clear that many options, both in use of funds and classroom arrangements are available if we decide to look for them.

Journey into the Classroom
Places to be Alone

It was February, more than half way through the school year, when 3rd grade teacher, Mia, agreed to switch from her Title One support position to one of classroom teacher. This class of 27 students had been through multiple teachers and substitutes that year. When Mia entered the classroom to take stock of its current environment, she found a classroom that was not designed well for anyone to function. The rectangle shaped desks were organized in a large square. The teachers desk was front and center. There were long cabinets along each wall and they were piled with photocopies.

Clearly, this classroom had no spaces that provided places for the children to have some private space throughout the course of the day. Mia knew these were very active children and had caused teachers lots of trouble this year. These students obviously needed an environment that worked better for them.

She set out to arrange the classroom so that it would work for a classroom of challenging and diverse children. She cleared out all the stacks of papers, cleaned cupboards, and put up bright bulletin boards.

However, she was most concerned about how she might provide some spaces where students could be more private. With the help of two other teachers whose opinions and teaching style she trusted, she began to create a different environment. She grouped all the desks in clusters of five so that children could work in a small group and help one another. This opened up space at the front for a group area

which she set off with a bookshelf and a rocking chair that she had purchased. She created working areas for different types of activities by turning the cabinets, which were not attached, at a right angle to the wall. As she moved tables into spaces created by these cabinets, she intentionally left some small spaces between cabinets and walls that were just perfect for small children.

She also found a study carol that had been used to separate one student from others. Instead she created a "Safe Place" to which any child could go to unwind. She assembled a bucket filled with all sorts of useful objects: a stuffed animal to hug, squeeze balls and worry stones to handle, colored paper and pens to on which to write notes. She put up bright pictures on the walls. She also moved her desk off to the side of the room. She utilized one side of it so that students could work at it on the other. She also knew that students would like sitting in the space for the teachers legs underneath the table, so she turned it where this space would be out of eyesight of the other children. She also took a small table and put it in her line of sight in the hallway, where children could work. The area by the back door was set off with hanging plants and a large cushion to turn it into a private space.
So, with very little money and a lot of creativity she turned the classroom into a welcoming fun place to be. When the children entered the classroom for the first time their faces were those of stunned pleasure. One child even turned around and left thinking he had entered the wrong room.

Mia certainly had her work cut out for her with this class. However, very quickly she discovered that providing students with places and tools with which to unwind and comfort themselves paid off.

Reflection: Here we see a teacher who tried to think about the needs of her students, to image herself in their shoes, so to speak. It led her to creating space that made a real difference. However, as important, was her thinking process of carefully considering the needs of students. Very quickly students in this class, particularly those with the greatest challenges, discovered that this teacher really did care for them.

Effective Use of Limited Space

Having inclusive classes also helps schools use space most effectively. In the Georgetown example above, shifting to inclusive education would free up space in a very crowded school. Belle Elementary School provides another example of possibilities. As in other schools in this district, the school library had virtually disappeared, a fact that was of great concern to teachers and the principal. The room that had been the school library was being used for a special education class. The special education teacher convinced her principal to let her students attend general education classes, thereby allowing her room to be used as a library and teacher workroom.

Spaces for Specialists

In a whole school, specialists seldom use offices for pull-out services. Because such specialists spend most of their time in the classroom, they often have designated work space there. Some classrooms may have two desks, one for the general education

teacher and the other for a specialist or support teacher. In other classrooms specialists and the teacher might have one desk, since they are seldom in that area for any length of time. Often these professionals will be housed together in an office, freeing up some space where teachers can counsel individual students and parents or work with small of groups of students in activities. Housing a small group of specialists together also has potential to increase day-by-day communication regarding issues, needs, and strategies being implemented with specific students.

Lunch and Recess

Given their relative lack of structure, lunchtime, recess, and extracurricular activities present both opportunities and potential problems. How schools structure and foster community, responsibility, and inclusion during these times is important. Teachers are usually on their break, and there are easily 200 to 300 students in one area at a time. At lunch students must all be able to eat and get back to classes on time in an orderly fashion. If a student is not accepted, it is at this time that he or she is most rejected, even ridiculed. Similarly, if there are racial tensions, they are most likely to be come evident during lunchtime. On the other hand, it is during this time that students have a chance to really talk, play, and engage one another as people, and relationships can flourish.

A typical reaction to lunchtime tumult is to ask students to sit quietly without talking at assigned tables. However, this is one of the few times in the day when students can chat with friends and interact without interrupting someone's learning. Students need this break. Instead of trying to control their actions, we should devise ways to teach them to make responsible choices during unstructured periods.

What might make students comfortable, keep their interest, and encourage positive interaction during lunch, recess, and in extracurricular activities? Effective elementary and secondary schools establish a selection of interesting activities students may engage in during their free time with the help of teachers, aides, and community volunteers. Students rotate between activities, changing who gets first choice every day. This idea works well at all ages. Some of the ideas schools have organized include:

- Computer time
- Outside organized games
- Art areas
- Board games
- Literacy rooms, where kids are led in group activities like poetry and singing
- Tutoring room
- Gym time with games and exercise classes

Torland City High School, for example, runs such a program with community volunteers. A student with autism at the school has made friends with some other students in the weight-lifting program. This has reduced his sense of isolation, which was a great concern for all.

In addition, many schools assign older students jobs during lunchtime. In some schools teachers choose to eat lunch with their students. Other teachers meet several times a week with different student groups, eat lunch, discuss ways to help one another, and do fun things together.

Using Materials for All Students

In inclusive schools, materials bought through different programs benefit all students. In other words, materials purchased with Title I, special education, or gifted and talented funds are not locked in closets when the special teacher isn't using them with a labeled population of children; instead, these materials are used throughout the school.

Getting Places

Some students with disabilities have special needs for transportation that are difficult to meet on conventional school buses. Consequently, special education programs often purchase small buses that can transport children who use wheelchairs or have other special transportation needs. However, the "handicapped bus," like a special education classroom on wheels, separates students with disabilities. What to do? First, many students with disabilities can be transported on a typical school bus. Increasingly, buses are being designed with lifts and space and locks designed for wheelchairs. Older buses can be retrofitted: Taking out some seats provides a place for the wheelchair. It is also possible, although this is a less desirable solution, to arrange routes so that some students without disabilities ride in the special bus with wheelchair access. Students who have needs other than wheelchairs can be paired with other students in their area and ride the regular bus, or an aide may ride the bus to provide assistance. In addition, many students come to school through car pools, and parents can work out arrangements with one another. Whatever the solution, a team of general and special educators working together can help put inclusive transportation into action.

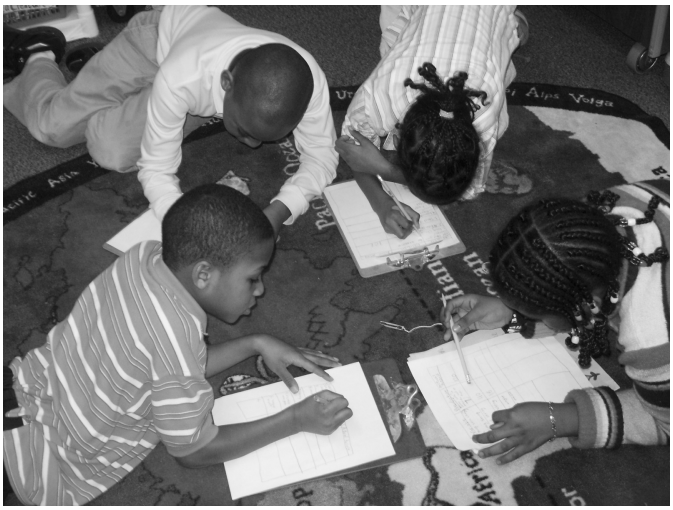
Inclusive Playgrounds

One physical location that is important to all children is the school playground. Nationally and internationally, people are beginning to use the principles of universal design to develop inclusive playgrounds**.** As part of this movement, an organization called Boundless Playgrounds was created in 1997 as a grassroots movement inspired

by Amy and Peter Barzach of West Hartford, Connecticut.

In the summer of 1994, [Amy and Peter] observed a beautiful little girl in a wheelchair watching bravely with quiet tears while other children enjoyed a playground that this child was not able to use. Five months later, the couple's nine-month-old son, Jonathan, died from spinal muscular atrophy. To work through their grief, a bereavement counselor encouraged them to do something in his memory. The couple recruited and mobilized an army of 1,200 volunteers to create a playground where children of *all* abilities could play together—including children like the little girl they had seen at the park. Research, creativity, hard work, and community support combined to form an extraordinary and universally accessible 25,000-square-foot playground, "Jonathan's Dream." Opened in 1996, it is the first Boundless Playgrounds children's park. (Boundless Playgrounds, 2001)

When an article appeared in *Time* magazine, Amy and Peter Barzach received hundreds of requests for assistance from around the world. In 1997 Boundless Playgrounds was formed, and by 2001 the organization was operating twenty-four projects in disadvantaged communities.



The National Center on Accessibility (2000) developed guidelines for parks based on the Americans with Disabilities Act that can be helpful to schools. An interesting project for students would be to investigate how to make play accessible for all children using these guidelines. To meet the guidelines, at least one of each type of *ground-level play* components on a playground, such as spring rockers, swings, and stand-alone climbers, must be accessible. Although not all *elevated play* structures will be accessible, access to ground-level play structures is used to offset this. For example, if a play area has ten elevated play components, at least five must be accessible. In addition, at least three accessible ground-level components are required, each of a different type. At least half of elevated play areas must be accessible by ramp or by transfer via a special platform. *Soft contained play structures*—such as ball pools, slides, climbing nets, and crawl tubes—are enclosed and made of pliable materials such as plastic, netting and fabric. These devices must provide access to the entry points of each structure and should be accessible via ramp, transfer system, or platform lift.

In addition, designers of play components should consider:

- Space for wheelchair maneuvering to and from the play component
- Wheelchair space
- Height and clearances of play tables
- Height of entry points or seats
- Provision of transfer supports (such as a grippable edge or some other means of support)
- Surfaces soft enough to limit injury from falls but also firm and stable enough for wheelchair maneuvering

Once we begin to understand and think about how space is or is not accessible to all children, we don't take it for granted that some children have to be excluded. We realize that we can work to change the environment.

The Classroom

Designing an Inclusive Learning Community

Our own classroom, of course, is the space most important to us. How do we design an inclusive classroom? How do we improve our teaching and learning environment over time? Several key guidelines to consider:

1. Establish a comfortable, homelike atmosphere: colorful carpets, beanbag chairs, group area.
2. Allow for different learning styles, providing tools and resources that give students alternative points of access to information, such as ...
3. Design multiple ways for students to obtain information and express learning.
4. Ensure sensory and physical access.
5. Use space in the school and class to support inclusive teaching.

We seek to design our class so it includes all, provides emotional support, and allows us to teach effectively. We want people to walk in and know this is a place where real learning is happening for very diverse learners.

Classroom Design for Whole Schooling

Our use of space is one important way we move toward or away from best practices. Traditional teaching is organized hierarchically: Students are involved in individual, rather than collaborative, work and are focused on minute skill development rather than on authentic and meaningful tasks; classes are dominated by teacher lecture rather

than by student-initiated work (Goodlad, 1984; Haberman, 1998; Kohn, 1999). It is not surprising that in traditional classrooms the arrangement of physical space is designed to reinforce this approach. Traditional images die hard. Like lecturing at the chalkboard, moment-by-moment teacher domination of the learning process is still preeminent—and so are the traditional rows of desks.

If we seek to implement best practices for diverse students, however, we will use space and physical resources differently. If we are to build community in our class, we must organize space to encourage student interactions, cooperative work, and collaboration. If we are to teach authentically, our class will begin to look like a workshop.

Making a Home in Our Class Students of all grade levels learn best in classrooms that are inviting, warm, and cozy rather than formal and stress-inducing. The more we can create relaxed and secure classrooms, the more students will take risks, and the more they will learn. To start, we assess our classroom. Where are the windows, outlets, doors, tables, cabinets, computers, the sink? What arrangement of areas will make the room work practically and make it stimulating? Many effective elementary teachers put quiet areas, like reading, writing, or listening centers, on one side of the room and louder areas, like science, math, and art, on the other. We can use windows to create a science area that includes growing plants or birds at a feeder, and we might put the aquarium or art center by the sink. Plants and lamps add to the appeal of these areas and create a comfortable atmosphere. An area does not have to be large to be effective. A poetry area could simply be a bucket full of poetry books located near a poetry bulletin board that the children change weekly (Fisher, 1995; Zutes, personal communication, March 17, 2000).

In a middle or high school class, we can use similar strategies. We may have activity areas for centers that focus on different activities, group work, and small group discussions; a video center with tapes, videotapes, and CD-ROMs; a place for art and design work. Computers may be either in one part of the room or spread around. Plants and animals can be valuable in a secondary class as well. In all, we seek to provide a sense of home and comfort, areas and resources that work for different learning styles, and tools to facilitate different modalities of information access and expression.

Classroom Decor and Ownership We talked to Mark about how he decorates his eighth-grade classroom. "When I began teaching," he said, "I made a conscious decision not to use commercial posters or materials on bulletin boards. I put up bright fadeless paper with colorful borders, and a few things such as a calendar and some titles as to what might go on the boards. When the students arrive, they see a brightly colored classroom that has only begun to evolve." He went on to explain that he involves students the first day in discussing how bulletin boards might be used, how they would fill them with student work throughout the year, and who would be in charge of rotating them.

Part of building a learning community is creating an environment both students and teachers enjoy. This is important for secondary as well as elementary students. The walls can be a collage of interesting materials to explore and from which to draw ideas. These will include student work, book covers, artwork, artifacts from places being studied, information on famous people, multiple posters, a calendar, maps, interactive bulletin boards to do in spare time, pictures, and anything else that will pique students' interest. We involve students in deciding what types of work and artifacts should be displayed. We might even take a hint from some restaurants, which cover the tables with white paper and give out crayons. Some items, such as detailed self-portraits, will decorate the room all year, however to keep the brain alert, at the environment has to change periodically as well. It even works best if we coordinate a change of materials with the start of a new unit. The association with new materials will help imprint the new learning in the children's minds.

Student Seating We learn a lot about a teacher by observing his or her class. If students are expected to stay in their individual seats and not interact with others, we can be sure that the teacher spends a lot of time and effort trying to control students. Students do not want to stay by themselves for six hours a day, so they will inevitably push their limits. In such a situation, students who have different learning styles or need the help of peers will become problems. Control-oriented teachers respond by removing such students, often alienating others through fear.

In an effective inclusive class, in contrast, students sit in groups in which we encourage social interaction. Yet we also structure places where students can be alone, and for this purpose we find that using tables instead of individual desks is most helpful. However, many districts are unable to spend the money to replace their individual desks. In these schools we can push desks together to form clusters where students can work together as teams.

Creating ways to let students move throughout the day allows students who are stimulated through kinesthetic movement to learn more effectively. However, for some students this will not be enough; flexibility in seating is also important. We can allow kids choices about whom to sit with. One tenth-grade computer lab teacher says, "You may sit anywhere, as long as you are working!" What is important is not that students are sitting in their seats but that they are learning and having fun. We find that given choices, students will end up in many varied seating arrangements. Having places where kids can sit in chairs is only one option. Other approaches:

1. Provide pillows and carpet squares to sit and work on.
2. Demarcate standing stations at cabinets, podiums, or counters for when students need to work but are tired of sitting.
3. Furnish old easy chairs or rockers to be comfortable on.
4. Plan areas that are under, behind, or beside things where students can feel private.
5. Allow students to sit on tables and cabinets.
6. Let students work in the hallway at an extra desk or table or on the floor.
7. Clearly state that students can sit at anyone's seat as long as they respect the person's possessions.

Encouraging daily interactions by teaming students makes sense on several levels. Young people need to feel that they belong to a team and that their ideas are valuable. Seating students in groups also helps us foster community by providing ongoing, natural opportunities for interaction and sharing.

We are careful, however, not to cluster students by ability. Rather, we intentionally structure heterogeneous groups based on multiple variables—racial backgrounds, abilities of various sorts, personalities, genders. Erasing ability lines does not mean putting students together at tables in any haphazard way.

1. What personalities will complement each other?
2. What students are unable to interact well together?
3. What are the academic strengths and weaknesses of each student?
4. Do certain students need friends they have connected with nearby?
5. Are certain areas better equipped for certain students—for example, for students who daydream, need to move a lot, need to be alone, or need to be social?

Finally, we also organize space so that there is room between tables or clusters of desks. Open space is essential for students who use wheelchairs or who have difficulty walking, such as students with cerebral palsy. Providing open space further allows students to work easily in different places—on the floor, at other students' desks, under desks, or in the group area. In areas where this is difficult due to limited space, create an

open pathway from one area to another.

Group Area Every classroom needs an area where the class can meet to conduct whole class activities. Whether the teacher is reading or explaining an experiment, the group is working on a math problem, or a class meeting is being run, gathering students together increases the feeling of community that is vital to helping students grow. The area should be defined so that it is recognized as a separate place. There may be a rug, individual carpet squares to sit on, or a chair. Whether there is a carpet or a rocking chair by the open space, this area becomes the focal point of the room (Fisher, 1995).

Individual Space In an environment in which we expect students to interact peacefully together for a long period of time, we specifically design ways for students to find private time and work individually. We can do this in many different ways. For example, in rooms where there are movable cabinets or bookshelves, we can often turn these to extend out from the wall, automatically creating dividers that children can sit around and behind. We can place tables or pillows in the hall. Separate desks can be designated for students who choose to sit by themselves. While we may be concerned that we cannot see all our students, we can learn to listen well. One sixth-grade teacher said to her class, "I can tell that some people have gotten off task, because the noise no longer sounds like working noise but playing noise. I would ask some of you to make different choices." She then proceeded to walk around and talk to several students (Fisher, 1995).

Learning Centers In a well-structured environment, we plan ahead for students who finish early. Some of these students fulfill their need for social interaction by helping others with their work. Others will want different choices. Having *learning centers* with which students are familiar encourages them to engage in meaningful activities without taking our time away from students who still need help. Learning centers can be used for all ages of students. They should be easily recognizable, and the students should be taught how to use them ahead of time. Directions should be left by the area, and supplies should be easily accessible. In any given center directions for different levels of learning can be left, allowing for children to choose the level of assignment that is best suited to them. For example, a math center in a 5th grade classroom could be left with directions for three different games, one practicing basic facts, one practicing adding fractions, and one practicing division. Some children also have independent studies that they contract to work on when they have completed other work. This arrangement gives students shared responsibility for continuing learning and maintaining order in the area, stimulates independence, and adds to the homey feeling of school. Some examples include (Fisher, 1995; Jensen, 1995):

1. Opportunities to create plays and develop songs, using music synthesizers on the computer, to illustrate the class topic
2. Microscope setup with slides provided
3. Class museum on current topic
4. Activities that involve maps: map hunts, map puzzles, maps to create own trip plans
5. Theme-related books
6. Listening center with books on tape (even for older students)
7. Math puzzlers: problem stumpers on current topic
8. Writing center where students can find a story starter, write poems, write letters to friends, make cards, or "publish" books
9. Spelling games: word hunts, games that use letters, crossword puzzles, magnetic letters to practice spelling
10. Math games that use cards, dice and handmade gameboards to practice skills

Hallways as Learning Places In an inclusive school, space is used in creative ways for learning. In many schools, students work in hallways—alone, in pairs, or in small groups of three or four. When you ask students why they are there, it's never because they were misbehaving. Many like the novelty of working in the hallway; for others it is a quieter place to concentrate.

Many teachers devise creative spaces in or near the classroom for one-on-one or small group work. In these spaces teachers bring students together for multiple purposes, to receive assistance from a volunteer, or to work together on a collaborative project such as writing and rehearsing a play. One elementary school teacher took a large cardboard box that had housed a new refrigerator and, together with the students, cut and decorated it so that it looked like a castle. She placed it right outside the entrance to her room. Students use it as a reading corner or a place for two peers to talk or work on a project together. Other teachers obtain similar results by using a small tent, either in the classroom or just outside the classroom.

Movement, Food, and Drink We can also give students opportunities for movement—over and above walking down the hall with a pass to the bathroom. In one fifth-grade class, as the students finished work, they joined a "parade around the classroom" in which students quietly walked, making gestures as in a parade. Another teacher put on

loud music chosen by the students to which they danced individually or in a simple line dance as a five-minute transition activity. Other teachers have five-minute aerobic exercises or activities that involve sharing information, such as searching for clock partners throughout the class for a few minutes.

Some students also need food and drink to function at their best. If we think about ourselves, how often are we munching on a snack or drinking coffee or water as we work? The simple act of drinking water has shown to keep the brain more alert and ready to learn. Provision for eating and drinking can look different ways in different classrooms. Many high schools have drink and snack machines in the commons area; one of the best ways to gather people together is to provide food, so this draws students together as a community. Similarly, teachers can allow snacks or water bottles in the classroom. We can establish simple structures for keeping the mess picked up and avoiding accidents. Engaging students in this process increases their independence and responsibility.

Multiple Strategies to Support Access to Information and Expression of Learning

In an inclusive classroom we also need materials, tools, and media to help all students obtain information, develop products that demonstrate learning, and deal with their limitations—whether these limitations are in reading ability or in ability to walk or hear or see. The more resources we have for all students, the easier inclusive teaching becomes. What are strategies we can use?

Multiple Intelligences and Learning Styles Over time we work to collect a wide range of learning materials at differing levels of ability for different student interests, topics of study, and sensory input modalities. These will include (1) books; (2) alternative print access resources (scanners that can be used with talking software, books on tape, braille, sign language books on video); (3) computers; (4) media—video, CD-ROMs, tape recorders; (5) contacts for experiences in the community; (6) materials for hands-on activities—simulations and authentic experiences. We can use our knowledge of multiple intelligences as a framework to help us think about providing avenues for both input of information and expression of learning (Jensen, 1995).

Disability as a Tool for Designing Our Class for All Learners In an inclusive school, we want learning environments to include all students without necessitating special adaptations. That's the goal. A simple way to start is to analyze our school and classroom from the perspective of individuals with different types of limitations. We could even go farther and ask different people with disabilities to come to our class and help us think through how we use space, materials, computers, and other learning resources. We can also involve students in thinking from this perspective. It's a terrific

way to help them learn about disability in a framework that is positive and proactive rather than focused on deficits. Maybe we could borrow a child-sized wheelchair and have a student use it for a couple of days and make recommendations. We could do the same for hearing: All of us could wear earplugs and then identify ways to make the class better. Same for vision: Perhaps several students could wear blindfolds, and we could teach other students how to be sighted guides and help them go from place to place. We could all think together about how to make the class better for these students.

Also, when we know that a student with a particular limitation will be in our room, we can think about the design of our room with this specific student in mind. We can contact the family and arrange for the student to walk through and become familiar with the environment before school begins.

Students with ADHD often need more access to private areas where they can concentrate than do some other students. A student who is easily distracted can have problems in areas that would not bother another person. The buzzing of the overhead, people talking in the hall, or the chatter of birds can all distract certain youngsters but have no effect on others. Having areas to which students can retreat (and feel that it is perfectly acceptable) can break up the distractions of a large room. Finding out who works best in what situation is important, as long as it is understood that every student is part of the community and that where he or she works best is somewhere in this room (Zutes, personal communication, March 30, 2000).

In the figure on page 285 we've sketched some examples of how you might start this kind of "disability analysis" and chart out what you find. Take the simple matter of talking software. Initially many teachers acquire this for students with visual impairments and students who have difficulty reading—but discover that when their most able readers use the software on occasion, interest and comprehension rise dramatically for those students as well.

Books and Print Resources Whether we teach high school math or physics, fifth grade, or kindergarten, we need a multitude of books available at a wide range of levels.In specific subject classes, the books may revolve around one topic, but we will want a choice of genres, from fiction and nonfiction to poetry; from chapter books to references. Materials about any subject can be found in almost any genre (Fisher, 1995).

Disability Analysis for Learning

DISABILITY	ISSUE	STRATEGIES	BENEFIT TO OTHER STUDENTS
ADHD	Trouble sitting still; need for movement and places to be alone periodically	Movement around the class within certain guidelines as part of the daily routine Places in the class for being alone	Many other students also may need to move and be alone at different times.
Mental retardation	Limited reading ability Trouble understanding complex directions	Print materials with a wide range of ability levels and pictures Scanner and talking software Picture cues for tasks—teacher or student designed Peer buddies Cooperative groups	Students with limited reading ability benefit, as does any student who likes to hear a story. Other students can see different ways of communicating; strategies give them ways of synthesizing the key elements of a task.
Blindness	Inability to see print (reading books, directions) Inability to see videos	Books on tape Peer buddy for reading Adult volunteers Books on disk or CD with talking software Peer buddies to explain pictures Teacher describes key elements of pictures	Students with limited reading ability benefit, as does any student who likes to hear a story. Peer buddies focus on video content. Teacher's descriptions help students focus on key elements in video.
Deafness	Inability to hear teacher instructions Inability to hear videos	Interpreter Sign language instruction for classmates and teacher Closed-captioned films	Students learn another language; those with needs to move can do this as they talk. Comprehension increases for all. Students can talk watching video!
Epilepsy	Seizures	Carpeted areas; move furniture to prevent harm	Students learn sensitivity and are taught about preventing injuries.
Need to use wheelchair	Need for space to get around and access to materials	Books and resources at lower level Tables and spaces organized to allow for wheelchair access	All students have easy access. There is space for movement, creating a greater sense of openness in the room.

Some publishers provide identified reading levels of their publications. We should use such information, however, to guide students rather than restricting them to identified levels. We particularly should not have students self-identifying their level in a particular system. This can easily promote, on the one hand, a sense of elitism and, on the other hand, discouragement if students feel they are not advancing to higher levels.

To teach students to care for books, we must have and model a system. We need our books organized so students can easily find and replace materials. Some teachers organize books by author's last name, title, subject, or genre. Some group them in rectangular plastic bins, with the cover facing out; other teachers place books on bookshelves with the spines facing out. Or we can remove the doors from a conventional storage cabinet to make it accessible to students as special shelving for books about the current subject being studied. Or books on a current topic can be placed on a designated bookshelf or laid on a table to capture the interest of students as they walk by. Returning books to their proper place, taking care with books when we read them, and organizing books all requires constant review and modeling, even with older students. Putting certain students in charge of the classroom library gives them ownership of the process.

Computers and Technology As computers and related learning technology have increasingly become part of school life, the question of space to house them has become an issue. Many schools initially set aside a special room as the "computer lab" and cycled whole classrooms of students through it. More recently there has been a move to incorporate computers as part of the school media center and classrooms. The uses of computers in the classroom, too, have gone through phases. In some early applications, software was used essentially as computerized worksheets that could track student responses.

We now understand, however, that technology can help us embrace the principles of universal design, expanding our capacity to teach students with vastly differing abilities well together. Computers, rather than being taught as a a separate subject, can function as ongoing tools, much like a blackboard, in the classroom. Rather than using computers only to fill out electronic worksheets, students are learning to use word-processing programs, spreadsheets, databases, graphics software, and other electronic tools to obtain information in a variety of formats and to produce learning products. Computers can enable students to generate text, graphics, animation, video, and sound, and even to control robots.

For example, suppose we want students to obtain information about the Civil War. Traditionally they would read information in the textbook, which might have a few

illustrations and photographs. With a computer, however, students could:

1. Have the text read aloud via a speech synthesizer while they follow along in the book or simply listen.
2. Access a multimedia encyclopedia in which text could be read aloud and illustrated by graphics, pictorial illustrations, and even video clips demonstrating concepts or enactments of events of the era.
3. Access information at varying degrees of difficulty or complexity.
4. Use speech-to-text software to dictate a report rather than writing.
5. Create a presentation combining words and pictures to display knowledge.
6. Use bulletin boards, chatrooms, and online journals.
7. Create multimedia lessons and interesting projects for other students.
8. Develop electronic portfolios to demonstrate learning.

Many teachers increasingly communicate with parents via e-mail. Teachers may set up electronic bulletin boards for working groups of students and for open communication with parents. Student work may be demonstrated on a website or bulletin board, providing another way to facilitate interaction between school, home, and even the community. Teachers can access videos on many subjects and interesting lesson plans (through sites like www.UnitedStreaming.com).

Hearing and Learning In active classrooms noise can be a problem. Teachers may be tempted to talk loudly or may spend a lot of time trying to get students quiet so they can be heard. In one research study, however, Barnett (1982) found that the hum of engaged learning in a busy classroom actually helps students to screen noises and concentrate.

One important tool used in many schools is voice amplification. A microphone can be used to raise the loudness of the teacher's voice just a few decibels. This can allow the voice of the teacher—or of a student who might use the device—to be slightly above the classroom noise so that a normal tone of voice can be easily heard. Amplification makes it unnecessary for teachers to raise their voices in pitch and thus makes the whole environment more pleasant.

By recognizing diverse learning styles, we can create the conditions that are most conducive for learning. An understanding of learning styles helps us build on students' strengths and design instruction to respond to their needs. In addition, we can teach students to *understand their own learning styles.* When we do so we give them another tool for understanding themselves and becoming partners in designing instruction that meets their needs.

Contextual Elements of Learning Style

STIMULI	ELEMENTS			
Environment	Sound: Amount of sound desired. Music & talking for some; silence for others.	Light: Bright versus dim light. Use different light bulbs, loosen some; create dim areas with furniture in the class.	Temperature: Warm versus cool. Vary amount of clothing to regulate.	Design: Formal versus informal. Sitting in chairs and desks or lying on the floor with pillows.
Emotional	Motivation: High versus low motivation. What tasks or situations create?	Persistence: Ongoing attention to task versus needing frequent breaks.	Responsibility: Conforming with established rules versus needing choices and opportunities for creativity.	Structure: Need specific, structured guidelines for learning or only general direction.
Sociological	Being with people while learning. Desires to work alone, with colleagues in a group or team, or with one other person in a pair. Likes to work with an authority like a teacher. Or likes to vary.			
Physical	Perceptual: Preferred sensory input. Auditory: listening and verbal (often develops late elementary). Visual: print, art, shapes. Tactile/kinesthetic: touch and movement.	Intake: Eating, drinking, chewing to help concentration.	Time Energy & alertness levels at times of day – "morning person", "night person". When do peaks occur?	Mobility: Staying still versus needing to move.
Psychological	Analytic-Global: Sequential, step-by-step learners versus global, intuitive. Left brain versus right brain.	Locus of control: External needs for approval and recognition versus internal direction and goal setting.	Reflective-impulsive: Thinking deep but not volunteering answers versus immediate reaction to situations without substantive thought.	

(From Dunn and Dunn, 1987; Dunn, 1996)
http://www.learningstyles.net/

Learning styles have to do with how people are most comfortable learning and most receptive to learning. Learning styles can involve many specific variables, and many different approaches have been developed. Many are familiar with Grinder's (1991) description of visual, auditory, and kinesthetic learners. Jacobson (2002) has focused on the more sequential, analytic "left brain" versus the more global, intuitive "right brain."

Rita and Ken Dunn (1987; Dunn, 1996) have developed a useful comprehensive framework that incorporates detailed considerations of context (see figure above). We can use the framework presented here to structure our classroom so as to give students opportunities to respond to their own learning styles.

Environmental stimuli We can enable students to vary sound, light, temperature, and the formality of the learning situation in our class. For example, we provide headphones so that some students can listen to music while engaging in learning. Earmuffs are available to let some students shut out noise; other students work best in learning groups in which talk is encouraged. Similarly, various types of lighting are available in the classroom and in other areas, such as study carrels with dimmer illumination. To vary the temperature we allow students to wear less or more clothing and have portable heaters or fans available. Finally, parts of our classroom are informal —a couch, pillows on the floor, and so on—whereas in other parts we have formal chairs at tables.

Emotional stimuli We can design our teaching for varied emotional styles. Seeing lower levels of motivation as a strength is particularly difficult for us. However, if we accept this trait in students and seek ways to connect with those students' interests and needs, they will feel accepted and ultimately will perform more effectively. Similarly, we can provide opportunities for some students to work intensively on some projects while allowing others to take frequent breaks, perhaps shifting from topic to topic. To do this we structure our classroom time so that there are ongoing blocks of time for individual and small group work on assignments. For some students we provide highly structured assignments; we give others more global directions and provide support as they need it.

Sociological stimuli As we design our classes for diversity, we will want to provide students with a range of opportunities for working alone or with other people. In the learning process some students desire and actually need to work individually. Others will seek opportunities to work with a buddy, with an adult (this could be a teacher, a volunteer, or someone at home or in the community), with a group of students who work as a team, or even with students from another class. Allowing time for both types of activities is important.

Physical stimuli A diverse classroom will also attend to opportunities for visual, auditory, or kinesthetic learning experiences. Students should be allowed to snack or drink while working on projects. Teachers report that when they allow this in their classrooms, they set a few basic rules. Initially almost all the students will bring food or drink. After the novelty wears off, however, they settle into their personal style patterns, and only the few who really need this continue. Some teachers actually have small refrigerators in their classrooms where students can keep food and drink they bring to school. We can also help students understand their own best learning times and how to structure their class time and projects based on this knowledge. Finally, we devise ways to allow students to move about the room. Here again, teachers report that they set some basic ground rules. Within these simple guidelines students can move from place to place, stand while reading, or walk around the room thinking about a project.

Psychological stimuli Psychological aspects of learning styles require teachers to recognize and appreciate the variations in the way students' minds function and to respond to them accordingly. With students who are analytical, we draw on their strengths to help them sequentially develop work tasks. Yet we may also pair them with globally oriented students who teach them to look at whole concepts, to be less rigid, and to see relationships. We can similarly recognize each student's individual locus of control and build on the natural strengths inherent in this trait, helping students expand their repertoire. Students who have external locus of control will be very sensitive, for example, to the opinions and perceptions of other people and may help those with internal locus of control to hear what people are saying. By the same token, those who tend to act impulsively may demonstrate responsiveness and a sense of action, encouraging more reflective students to speak out. These latter students can, on the other hand, help impulsive students to think through issues more carefully.

How do we identify the learning styles of students? We find that the best and most efficient way is simply to watch our students carefully—a process we call "kid watching." We made a similar recommendation when we discussed multiple intelligences earlier. Kid watching simply means that we pay close attention to what happens with our students. We keep logs or journals and make notes about different students, particularly those about whom we are most concerned; we also keep an ongoing portfolio of illustrative student work. As we teach and watch our students, we will constantly be asking questions about how they learn and about the arenas in which they are most accomplished. Notes help us remember and organize that information. When students puzzle us, we will review our notes, study their work samples, and reflect on our teaching strategies, interactions, and relationships with them. By paying attention in this way, we can learn a lot; we can better understand our students and

constantly improve our teaching practice.

Technology in the Classroom

With the use of technology, a new world has opened up for students in terms of what and how they learn. Children and teachers are able to access more information than ever before. Teachers are able to use technology to provide different levels of learning and more variety. Technology in the classroom falls into four categories. These categories are: 1. Teacher created materials 2. Things students create or utilize on their own 3. Assistance for students who have special needs. 4. Connecting to families

Teacher created lessons and materials. The first category of teacher created materials looks at how teachers put together things for lessons. The inclusion of the Smartboard in classrooms has provided a way for the teacher to easily have engaging and interactive visuals that coincide with the lesson. It also provides a way to show directions for lessons, research questions together, and keep up with real world events. This screen that connects to the teacher's computer and shows it on a large screen allows for all of these options. In an elementary classroom setting, the teacher might use a variety of websites to create slides for lessons. Some teachers create a slide that walks through their daily lessons each day. Some teachers have sets of slides for different units. They can create interactive slides, where the students can move things on the screen. An example might be sorting words by spelling or grouping researching findings into different categories. In middle school and high school settings, these daily slides are then loaded to a school website program, such as Clever or Canvas, so that they can be accessed and reviewed from home. This allows students to see the materials whenever needed. If someone is helping them, whether another teacher, a parent, or a tutor, they can see what the students were learning in class.

Another way teachers use these learning platforms is to post videos of what or how they are teaching. Some teachers post it so students can review it from home. Other teachers post it to inform parents who are helping their student, particularly in elementary school. Still other teachers post information to be viewed at home and then do the work time in class. This is called a Flipped Classroom assignment.

Teachers also are able to easily share materials or purchase ones that another teacher has made which helps the teaching profession to be less isolating. Someone else that has the expertise can make your job easier. Overall, using these materials creates things that are engaging, suited to different levels of learning and that make it easier for more people in a student's life to access the learning. This makes learning better for all students.

Technology used by students. The second type of technology is that utilized by the student, either at home or in the classroom. Most schools are at least a 1:1 ratio of computers to students. Some districts are even 2:1, in which they provide a chromebook to students for use at home. There are platforms that are used to load assignments or directions for assignments that are not done on a computer. Seesaw, Canvas, Google Classroom, and Schoology are four such platforms.

Seesaw is used at the elementary level to post assignments for children. Since each assignment loads to that student's account, it is easy to make different assignments for different students. So students, in class or at home, are able to open up assignments and work on different things at the same time as other students.

Websites, like Shepphard Software as an example, have a host of games that are used to practice many math concepts. The games are leveled so students can be working on one game but at different levels. Group interaction sites, such as Kahoot, have students sign in to a group quiz. As they answer questions, their answers are tallied on the screen, identifying the top scoring people. It is a fun way to review a subject, other than worksheets. Similarly, websites such as IXL have a host of things that students can use. Teachers can assign things at different levels. A second grade teacher can assign work that is on grade level to some, below to others, and above to others, all on the same topic. They can create a leaderboard that tracks correct answers, however it does not say the level of the work. This allows all students to be honored for doing their work, regardless of level. This can be utliized for classwork, allowing the teacher to work with small groups of students. There is even a feature that she can monitor what they are working on via the Smartbord while she does other work in groups. Also, this can be assigned for homework, eliminating the same worksheet assigned to every student. Students can, at an early age, learn to find the answers to questions and create their own engaging slides to share information with others. This can be done on their own, or with partners, thus teaching them how to utilize technology and work with others. There are websites that post books for children to read. Often they have the option of the text being highlighted as it is read. On some sites, teachers can assign books at different levels to students. This makes it easier for students to access books. They can even access whole series of educational things at home, such as reading rainbow or magic school bus. The options for what they can do is really unlimited, all it takes is a little bit of creativity and a lot of patience in teaching them how to use it correctly.

Communicating with parents. The third way that technology is used is to communicate with parents. Just like connecting to people in other parts of the world is made easier by things like instagram, facebook, snapchat etc. connections are easier with families of students we teach. Many classrooms use texting apps like Remind to communicate

message with families. This allows the teacher to send out a text that goes to every parent that has signed up phone, without sharing their personal information. Similarly, ClassDojo has become a huge presence, allowing for messaging parents as a whole group, having private conversations, as well as other things like sharing photos of things going on in the classroom and signing up for events. Parents can get questions answered without it being a lengthy process. Teachers and families can form real connections to partner with families to build success for the students.

Technology has definitely changed how we plan for and present lessons and how students learn topics. With all change, there are amazing things that happen and limits to watch out for. Teachers have to be careful to use it for the good of students learning and not as an easy way to occupy students. With everything, there has to be a balance. Everything cannot be on computers. There has to be a balance between that new world of technology and the world right in our hands with books, notebooks, and writing with pencils. Games on computers are balanced with games using people, cards and dice. Books on the screen are not to replace books in person, but to supplement. Finding this balance is ever the challenge of the whole schooling teacher.

The fourth way that technology is used in the classroom is to assist students who have specific special needs. We will discuss this in depth in Chapter 8.

The Local Community

Local Resources for Learning

The local neighborhood and community is potentially an important learning environment as well. Although some schools divorce themselves from their neighborhood, others see their surroundings as a key learning resource—whether the area is filled with broken glass and a landfill or the school sits next to the city library and art museum.

If we look carefully at the instructional strategies described in Chapters 11-13, we will see what Kovalik and Olsaen (1997) call a hierarchy of preferred learning. In brief, rich immersion in complex experience is critical for learning, and the most powerful learning strategies immerse students in hands-on experiences and real-world events. This means that the local community can be the most valuable teaching resource that we have.

However, schools traditionally don't connect well with neighborhoods. The reality remains that schools are often physically separated from local community resources. Although it might seem natural and obvious, for example, to cluster schools and other community resources—local businesses, libraries, art museums, social service

organizations—we seldom see this. Consequently, we always have logistical difficulties in connecting with local communities. The most traditional procedure is the infrequent field trip, an event in which a busload of students is driven somewhere and then returned to the school. Yet this kind of experience is very limited. Given our constraints, how might we routinely see the local community as a learning environment? In Chapter 6 we explored some ideas taken largely from the work of Kretzmann and McKnight (1993). Here are a few others.

Almost all schools are located in areas with local resources. Residences, businesses, community institutions, even open fields can offer a wealth of learning opportunities. We have to think and look. We might start with questions about the area that students could explore. For example, if our school is in a neighborhood of houses, we might ask:

1. Who lives here? Where do they come from? Why do people live here?
2. What are the relationships among people in the local area? What types of problems exist? What do people think ought to be done about them?

We might gather information from the Internet, ask community members to talk to our class, conduct door-to-door interviews, walk through the neighborhood. We will likely find that as we follow leads and connect with area people, we will find opportunities to link literally everything in our curriculum to local resources.

In a movement called *place-based education*, a growing number of educational writers and reformers, including the leaders of the Annenberg Rural Challenge initiative, are calling for schools to center their study in the local community. Given the interdependence of communities throughout the world, this is not a return to a parochial view of the world. Rather, it is a way of connecting the larger influences, ideas, and needs in the world to the experience of students and their families.

As teachers we may have particular concerns about this approach if our school is located in a low-income neighborhood that many consider dangerous. Yet this is where our students live. This is their neighborhood. The fact that few teachers live in the area in such schools makes a place-based approach the more needed and powerful. We may begin to see new resources to strengthen learning in ways that we have not imagined; and we will likely gain important understanding and appreciation of the lives of our students, their parents, and the area.

One school we know well, for example, is located in a low-income area in a large city. Across from the entrance of the school are a series of houses, one of which burned to the ground and seriously damaged some of the other houses. The school has been broken into several times, and computers have been stolen. Behind the school is an empty lot;

across the lot are a pipe-threading shop and large outside storage areas for metal structures. The school has no playground. About two blocks from this school are two major streets and two large churches, both very old.

What might this area offer for study? We could start with the questions we asked above. Who lives here and why? Likely there are some very interesting people across the street who would appreciate the opportunity to share their experiences and ideas. What about the vacant lot? How big is it? Who owns it, and why is it vacant? What plants, insects, and animals live in this lot? The businesses across the lot—what do they make and for whom? What connections do their products have with other countries? Who works there, and where do they live?

Graves, Graves, Schauber, and Beasley (1999) and Russell (1998) have developed guides to help teachers devise lessons based on neighborhood studies and use of the school grounds and local areas for learning investigations; we recommend such guides to expand these ideas.

Students can be involved in important, real neighborhood projects that connect with others who are trying to improve the community. Lewis (1998a, 1998b) developed useful teacher guides for student involvement in social action and service projects, and Graves and Graves (1997) have described an interdisciplinary process by which students can engage in community planning. Other guides from the Center for the Understanding of the Built Environment (CUBE), too, can be very helpful to teachers. The potential for engaging inquiries that would involve literacy, math, science, social studies, art, and physical exercise is substantial. Such inquiries engage students in real experience, offering opportunities for children at multiple levels of ability to work together in pairs, small groups, and even large groups.

Sights to See

Nick. YouTube video regarding Nick, an elementary child with Down Syndrome, being included in general education classes. www.youtube.com/watch?v=ji3R30PT1PQ

Toward Inclusive Learning Places

In this chapter we've thought about applying the principles of universal design to our schools, classrooms, and communities to support the learning of all students. This is both a complex and an exciting challenge. We know that what we've outlined here only

gets us started. Yet we can build over time. Together with Chapters 11and 12, this chapter begins to give us a picture of how we might design academic instruction for all learners, build community that supports students emotionally, and design the physical learning environment to include all students learning together and to support best practices in teaching and learning. Over time, as we expand and hone our thinking, gather materials, and seek to use these ideas, we'll have some of the most exciting, creative, fun classrooms around—classrooms in which many students naturally thrive.

Traveling Notes

Teachers and students spend a lot of time in classrooms. It's important that we create as comfortable and useable a space as possible. Here are a few notes from this chapter of key ideas you can take with you.

1. Universal design is a concept and practice that helps us design environments and tools to take into account the full range of human variability. This concept is parallel to our designing for diversity strategy and can help us think about our school and classroom.
2. Schools and classes need to be based on guidelines for healthy environments: They should stimulate, enhance connections, do no harm, be beautiful and inviting, provide varied stimuli, encourage relaxation and privacy, balance constancy and flexibility, and use resources flexibly for multiple purposes. We want to see schools and classrooms in which people feel comfortable where the environment is welcoming and space is used well.
3. Schools can work to use the ideas of universal design in schoolwide design through a range of strategies. Among the most important concepts are the following: a sense of welcome; a commons area; small schools and schools within a school; parent and community center; using all space inclusively, no segregated classrooms; inclusive transportation to school—no special buses. As we look at schools and classrooms; provision of space that all children, even those with wheelchairs and other physical limitations, can access, both inside and outside
4. In our own classroom we can use space and resources to respond to our students' differing learning abilities, intelligences, and physical capabilities. Some strategies include: multiple places to work and be—teacher's desk, space in the hall, floors, comfortable chairs, tables; varied books and print resources at differing ability levels; classrooms should have spaces where students can be alone and also work in pairs and small groups.
5. Use technology to access information including use of text to speech and speech to text software; space that is organized to provide access and movement for all; and use the local neighborhood and community as extensions of our classroom; learning

expeditions can start right on the grounds of the school.

6. Resources are used for all children. Whether books on different levels, science experiment kits, or talking software, materials are housed in a place that can be accessed by all.

Stepping Stones to Whole Schooling

Following are some activities that will help extend your understanding and actions you may take to improve design of your school and classroom for inclusive teaching.

1. Think about a place you love to be, where you are comfortable and feel that you could be your best in learning new things. Identify this place, describe the setting, and explain what about it makes it a good learning place for you. What are implications for your classroom and teaching? How might these implications relate to students with "special needs"?
2. Conduct an assessment to determine how well your school is designed to promote community, engage children in learning, and be inclusive. This would be a great thematic study for children in your class. What does the school do well? What might be improved? How?
3. Teach your students about the idea of universal design. Engage the students in a unit in which they think about and design different types of environments that are responsive to the needs and characteristics of all people. (A great science project!)
4. Visit a traditional classroom that is organized with desks in rows and uses a textbook and worksheet driven curriculum. With the teacher's help, identify one student in that class who is having difficulty. During a class, watch what goes on. What are the needs of this student based on what you see and know from the teacher? How is the use of space, teaching resources, and learning tools helping or hindering his or her learning? What might be done to improve learning for this student?
5. Visit a school that is designing curriculum to address multiple intelligences. How does this approach influence the way that the school and its teachers organize space? What tools and materials do faculty have in their rooms that recognize multiple intelligences?
6. Conduct a disability analysis of your classroom or that of another teacher. Involve your students. Have students themselves identify practical ways that your classroom could be structured to accommodate each disability. Have them also talk about how such accommodations might help (or hurt) other students. What do you and they learn?
7. Visit a traditional classroom that is organized with desks in rows and uses a textbook- and worksheet-driven curriculum. With the teacher's help, identify one student in the class who is having difficulty. During a class, watch what goes on. What are the

needs of this student, based on what you see and know from the teacher? How are the uses of space, teaching resources, and learning tools helping or hindering the student's learning? What might be done to improve learning for this student? What might be the impact on other students if these changes were made?