An important part of any user-based programming for building design is the articulation of basic goals or issues to which the designed environment should respond. These issues should be generated from the basic purpose of the facility, e.g., education and socialization of children. This global goal is then branched out to broad, inclusive goals such as motor, cognitive, and social-emotional development. The list then continues with specific goals such as eye-hand coordination.

A closely related way to organize programming for design is to identify important user-relevant issues, e.g., the need for graded challenge in the environment. These issues become the target for intervention by design.

Our approach is to respond to both methods by design principles. These principles suggest critical environmental factors and characteristics of those settings which will facilitate the goals or resolve the issues. As developed in the last few years, design principles are intended to be abstract, general, evocative, and suggestive of a range of design options. Architects always use design concepts, like "this central spine". But these concepts are seldom behaviorally-based, they most often are very few in number, and they are very seldom evaluated or even questioned seriously. The notion of design principles advanced here are much like that of Alexandrian patterns (Alexander, Ishikawa, and Silverstein, 1977) in that they are behaviorally-based, argued on the basis of serious problems and research literature on those problems, are several in number, and are testable. But Alexandrian patterns are often criticized as being too concrete, specific and dogmatic. An attempt was made to communicate information which would provide specific direction and information suggestive of a range of design solutions, and thus which would stimulate the designer's imagination and intuition while avoiding overly doctrinaire and absolute solutions that might inhibit design innovation.
The following design principles were developed as a response to the user-based goals outlined in the previous chapter. A detailed discussion of each principle follows this list.

- Settings That Are Not Noticeably Different
- Common Entry and Circulation
- Linked Activity Areas
- Orderliness and Consistency*
- Repetition and Multiple Coding *
- Range of Environmental Stimuli*
- Barrier-Free Design
- Predictable Settings and Events
- Unobtrusive Observation
- Public Display of Accomplishments
- Variety of Teaching Areas
- Settings for Simultaneous Activities
- Individual Work Areas Within Larger Settings
- Retreat Areas*
- Resource Rooms For All Children
- Places For Informal Socialization
- Manipulable Settings
- Personal Territory and Self-Expression

* These principles were adopted from Designing for Handicapped Children (Moore, Cohen, Oertel and Van Ryzin, 1979), and from Recommendations for Child Play areas (Cohen, Hill, McGinty, and Moore, 1979).
ISSUE

Modifications of buildings for handicapped children have often resulted in spaces or equipment which are noticeably different from ordinary settings. These features reinforce negative stereotypical attitudes about the handicapped among other children.

DISCUSSION

Frequently the aspects of schools which have been adapted for use by handicapped are so obviously different from ordinary physical features of buildings. These spaces and apparatus are not attractive for use by non-handicapped persons. Areas where modifications for handicapped have been made, other than standard "barrier-free" compliance, include "indestructable" wall and floor finishes in special "self-contained" rooms, removal of decorations to avoid unintended stimuli and adapting knobs and switches for the benefit of children with fine motor control problems. In some extreme cases, bars have been placed on windows of handicapped rooms. In these cases, the changes are so visible that they allow viewers to make predictions about the activities and character of the people kept behind the bars. These assumptions lead to growth of perceptions which effect how handicapped children are viewed and treated by others, and eventually how they act and feel about themselves (Wolfsenberger, 1977).

PRINCIPLE

When it is necessary to make changes in school environments to accommodate handicapped children, the modified spaces and equipment should be usable by, and attractive to, all people.

RECOMMENDATIONS

- Exterior appearance of schools should not overtly indicate which areas of the building are for the exclusive use of the handicapped.

- Interior and exterior of handicapped areas should maintain basic architectural style and expression of the rest of the building.
- Materials, finishes, windows, etc., in exceptional education areas should be the same as those used in the remainder of the school.

- "Barrier-free" hardware should be attractive to, and usable by, all people.

- Ramps can be designed as sculptural elements which serve as major circulation paths for all people in the school.
COMMON ENTRY AND CIRCULATION

ISSUE

A common entry and circulation for all children is the place to start mainstreaming and reducing the stigma associated with being different and requiring special facilities and separate entry points.

DISCUSSION

At many schools the separation of handicapped and regular children happens before the school day begins: at the entrance. Due to problems of physical accessibility, or the location of exceptional educational facilities in remote areas of the school, handicapped are required to enter school buildings through separate doorways. Separate entrances are often followed by separation of circulation; back stairs, special wings, etc.

"The circulation design establishes the order, organization and functioning patterns of the school... the circulation ways provide an opportunity for stimulating learning, socialization and functioning pattern and physical experiences" (Hough, 1971). By denying handicapped children the opportunity to move throughout the building in the same way as other children, an important opportunity for interaction is also denied. The child brought in the back door is socially isolated and susceptible to stigma.

PRINCIPLE

There should be a common entry for all students which is part of a circulation system that is usable by all and connects the entire school building.

RECOMMENDATIONS

- Entries should be usable by all children.
- Provide a common bus pull-up and drop-off point.
- When ramps and elevators are provided, they should be usable by everybody, and located adjacent to other circulation systems.
- Special areas should not be grouped "in the back", but organized along the building's common circulation path.
ISSUE

The different activity zones of schools should be linked physically and conceptually so that it is clear that exceptional programs are as much a part of the school curriculum as any other activity.

DISCUSSION

In many schools which have been adapted to accommodate exceptional education and mainstreaming, special class zones have been established in basements, ends of wings, or specially constructed annexes. As discussed in Settings for Simultaneous Activities, it is desirable to conduct exceptional education programs in the same environments where regular classes take place. It is recognized that under certain circumstances it may be desirable to work with children in more private settings. However, the extreme separation of exceptional education rooms leads to unawareness of the nature of educational programs for handicapped children (Abeson, Blacklow, 1971).

The forced, and often obtrusive, movement of mainstreamed children from regular to exceptional classes heightens awareness of the differences of the handicapped, which is contradictory to basic mainstreaming objectives. Movement through the school building is difficult for many handicapped children, and may result in added frustration (Bayes, 1967).

PRINCIPLE

Cluster regular and exceptional activity zones so that they are linked conceptually as well as physically. Eliminate the necessity for children to move through long, undistinguished corridors from one activity to the next.

RECOMMENDATIONS

- Achieve conceptual connections between activity areas by keeping them close by and convenient to each other.

- Movement between activity zones should be through informal meeting grounds which are familiar and friendly places.

- Use graphic symbols to identify activity areas, for ease in orientation.
ORDERLINESS AND CONSISTENCY

ISSUE

Handicapped children are often confused and disturbed by environments which are overly complicated and ambiguous.

DISCUSSION

Many exceptional children, particularly those with emotional and learning disabilities, have perceptual difficulties. Exposure to excessive environmental stimuli may cause frustration or even throw these children into a hyperactive state (Cruickshank, 1967). The architectural elements in a school which may be confusing to exceptional children include: highly rhythmic patterns, clashing color schemes, suspended building elements which appear to defy gravity, unclear connections between mechanical systems and control switches, ambiguous relationships between indoors and outdoors....(Bates, 1971). A high degree of orderliness and consistency may reduce irrelevant stimuli and resultant frustration and hyperactivity and therefore increase suitability of these environments for learning.

Applying this notion to exceptional children suggests that school environments should be subdued. However, in mainstreamed schools, the same environments are to be used by handicapped and non-handicapped children. If environments are too subdued, they would then begin to leave out variety and become boring for those who are not handicapped.

PRINCIPLE

School environments should be orderly and consistent so that they do not confuse exceptional children, yet they should not be so subdued that they lack interest for regular children.

RECOMMENDATIONS

- Have focal points with a range of environmental stimuli within each classroom.
- Reduce irrelevant stimuli in "common" or public portions of schools.
- Doors should generally swing the same way.
- Locks, latches, switches should be consistent and easy to operate.
- Avoid use of fake materials which do not feel or behave like real materials.
- Disclose relationships between mechanical systems and control sources to demonstrate cause and effect.
- Do not eliminate environments which are intriguing, novel, or complex.
REPETITION AND MULTIPLE CODING

ISSUE
For some children, information may have to be repeated several times, in a variety of ways, for them to fully comprehend the message, and to keep interested in learning.

DISCUSSION
The exceptional child needs more than the usual amount and range of stimuli and repetition in his environment, to compensate for perceptual and/or learning difficulties the child may experience. Cues may have to be repeated several times over to help an exceptional child grasp a message. This "repetition...helps maintain the child's interest in learning. It also helps the child achieve generalization, and thus apply newly learned information to other situations" (Moore, Cohen, Oertel, Van Ryzin, 1979).

It is also important that information be directed towards all the senses. This is multiple coding--the use of several cues (color, shape, texture) to identify an object or space. This multi-sensory communication can deliver concepts and information in a variety of ways, with one sense reinforcing the other. "Multiple coding is important to cognitive and perceptual development, because every element, or group of elements is coded, explained, and explains in a variety of ways, the child's awareness, vocabulary, and mental capacity are expanded (Moore, Cohen, Team 699, 1977).

PRINCIPLE
Develop a learning environment that is rich with information for all the senses. Multiply code spaces and objects by color, shape, texture, etc., and use repetition of cues and elements to help children grasp concepts and ideas, and learn to generalize.

RECOMMENDATIONS
- There should be a planned amount of redundancy, repetition and reoccurrence of space types. (Moore, Cohen, Team 699, 1977)

- When using numbers, words, colors, textures, shapes, etc., provide as many ways as possible to relate the same idea or meaning. (Moore, Cohen, Team 699, 1977)
• Color and numbers should be used in an integrative way to reinforce what is already inherent to the environment. (Moore, Cohen, Team 699, 1977)

• Shapes, colors, textures, and designs should be repeated in different, moderately complex ways. (Cratty, 1974)
PUBLIC DISPLAY OF ACCOMPLISHMENTS

ISSUE

Recognition of children's accomplishments and successes can help them to develop confidence and a positive self-concept.

DISCUSSION

Handicapped children's frustrations in handling tasks that their peers do with ease may affect their performance in other areas of development. The child may exaggerate his difficulties and feel inadequate, when in actuality he is capable of accomplishments in many other areas. It is important that children take pride in small things, and are encouraged by special, personal accomplishments. In order to do this, the child's successes need to be more apparent than his failures. Each step the child takes in his own personal development should be obvious.

PRINCIPLE

Provide places and times where good work and other accomplishments can be displayed and discussed.

RECOMMENDATIONS

- Provide the opportunity for immediate display convenient to work areas; tack space, shelves etc.
- Clearly identify work with the student responsible.
- Set up a changing display area in public parts of the school to present good work by students to visitors, teachers, and other children.
Handicapped children should have the opportunity to receive personal instruction, work independently or briefly retreat without completely removing themselves from the regular classroom.

Most of the previous thought on the issue of individual work areas stresses the value of privacy for development of personal and mental well-being (Moore, Cohen, and Team 699, 1977; Whalen, Flower, Fuller, Jernigan, 1975; Bayes, 1971). Recommendations for designing individual places stressing the most stringent aspects of privacy have called for solid walls and doors, sound insulation, and physical isolation. These recommendations do not take into account the fact that amounts of desired privacy may often not require absolute seclusion (Wolfe & Caufier, 1975). Furthermore, over-frequent removal of handicapped from the regular class to private, secluded areas calls undue attention to the social needs and problems of these children. Cohen, Hill, et. al. (1978) show that children like to be alone at times yet still be able to observe others. This, of course, is precluded by complete seclusion.

Places appropriate in scale for use by one child, or child and teacher, should be created within the regular classroom.

- Change the scale to indicate a more intimate place within a larger setting, through change in ceiling height, a loft space, a level change, etc.

- Define a place "big enough for two", with movable partitions, and screens to create privacy.

- Individual work areas should be physically and visually accessible from larger class areas.
ISSUE

Maintaining "Resource Rooms" which are exclusively used by handicapped identifies these spaces, and its users, as being different and leads to growth of stereotyping and stigma.

DISCUSSION

In most mainstreaming situations, some areas are reserved exclusively for remedial instruction of handicapped children. These areas are usually called resource rooms. Frequently, resource rooms serve as "home rooms" for handicapped children. This is where they are based and the bulk of instruction takes place. In this sort of arrangement, handicapped children venture out of resource rooms to join other children only for specific activities at designated hours.

A sense of mystery may become associated with these areas because they are kept unknown to most children. This sort of mystery eventually leads to the development of stigma and the reinforcement of negative stereotypical images. These attitudes are difficult to change. However, if children are given opportunities to "put themselves in someone else's shoes," they can become more sociable, and understanding of each other (Gottman, Gonso, & Rasmussen, 1975).

If the resource rooms were occasionally available for use by all children. The stigma associated with "being different" would be reduced and all children could gain broader understanding about the needs of each other.

PRINCIPLE

Provide instructional materials and apparatus in resource rooms which would be useful to all children. In this manner, the process of moving handicapped children to regular classrooms from resource rooms would occasionally be reversed.

RECOMMENDATIONS

- Locate resource room in close proximity to classroom areas.
- The resource room could remain a specially defined space, or become part of a larger, common instructional area.
- Double-function apparatus and learning materials to make them suitable and interesting for all children.

- Provide screens or movable partitions to achieve visual privacy, when desired.
MANIPULABLE SETTINGS

ISSUE

Providing children with opportunities to positively effect the environment contributes to the development of their self-concept and independence.

DISCUSSION

"The physical world surrounding children is usually determined by adults;... There is rarely an opportunity for children to make their own decisions about the environment they live in, learn in, play in" (Madeja, 1974). The child, given an opportunity to manipulate their own environment and effect a noticeable change, is rewarded with a sense of accomplishment. Through effecting changes in their environment and experiencing the results, the child can learn a sense of responsibility and accomplishment. A child is able to make decisions and see them through.

A manipulable environment can be adjusted "to the functions they (the children) wish to perform...the children structure the space in which their experiences take place..." (Ispa & Matz, 19 ), taking interest in the changes and responsibility for their actions. Through this special responsibility grows a feeling of independence, that they are important people too, and that their environment can become much more responsive to their needs if they take action.

A good room arrangement can help provide children with the message that they can make decisions about what they are going to do and how they are going to do it. (Ispa & Matz, 19 ).

PRINCIPLE

Allow children the opportunity to manipulate and make decisions about their own environment.

RECOMMENDATIONS

- Furniture should be movable, and room arrangements flexible.
- It should be possible for the children to effect changes upon and individualize the physical space. Let them paint a wall, or even move it.
- Increase children's involvement in decisions and actions about their space.
- Provide places for large group involvement, such as a wall mural or a class garden.

Let's Mural!
For some children it is critical that they know what to expect from a situation, before entering and abruptly encountering a change in activity and behavior.

"The most demanding time and place that must be dealt with by the handicapped child occurs with their arrival at school in the morning and entrance into a classroom" (Hewett, 1974). Entrance into a new area is accompanied by a change in activity and in expected behavior. Some children have difficulty understanding that different rules and expectations accompany different activities. The child should be given the chance to recognize and prepare for such changes, to see beforehand what activities are taking place and what behaviors are expected.

Knowing what is expected is especially critical for places of casual encounters and large gathering places—the library, gym, lunchroom—where the child takes initiative to enter and interact. Fear of the unknown may be enough to discourage the child from participating.

The entrance transition also involves the expected relationships once inside. "It is important that the child, when entering a space, encounters the relationship that he (she) has grown to expect . . . . reducing the frequency and intensity of undesirable confrontations" (Bayes, Francklin, 1971). This is critical for handicapped children; particularly blind children who orient themselves by tactile means, and emotionally disturbed children who need a slower introduction to change and will have difficulty accepting sudden interruptions in routine.

- Provide view into activity before entering.
- Provide a place to stop and scan and make a decision about entering.
- Orient activities inside away from entrance, to avoid face-to-face confrontations.
- Maintain a degree of consistency and predictability in identification and orientation of rooms.
Handicapped children in a mainstreamed setting may occasionally need to get away and be by themselves for a while in order to regain self-control or confidence when faced with overly intense, or too challenging situations.

Provision of breakaway areas allows handicapped children the opportunity to be alone in order to come to terms with themselves and the situations which trouble them. Frequently, handicapped children in mainstreamed classes are involved in situations which may be too intense or stimulating, which can cause frustration, fear, or panic. Assigned tasks may be too difficult to successfully complete and feelings of embarrassment, contributing to poor self-concept, may grow out of the repeated failures. Allowing the child to make a face-saving exit may be of assistance in allowing the child to maintain positive self-concept (Moore, Cohen, and Team 699, 1977). A usual approach to this problem at centers for exceptional education has been to send children to "time-out rooms" which are physically, visually, and acoustically isolated from the remainder of the school.

Use of this practice in mainstreamed schools, however, may present several problems. The removal of handicapped children to places which are unseen and unknown of by the other children might result in an unintended mystique attached to the retreat areas, and may add to the exaggeration of the differences of the handicapped, which leads to the development of stigma. Some prior studies have shown that even when children wish to be alone, they still prefer to watch the others (Cohen, et al., 1978) Furthermore, many school systems require adult supervision of children at all times. In public schools, additional staff would be required for supervising children in time-out booths.

Small, sheltered spaces should be provided adjacent to the regular activity areas in order to allow children to temporarily separate themselves from the larger group in order to obtain relief from potential failure, anxiety, or overstimulation. These spaces should maintain some physical and conceptual connection with the activity setting.
RECOMMENDATIONS

- Breakaway areas should be connected to the large group area to permit children to get away but still be able to watch the class if desired and also be within the range of teacher supervision.

- Retreat and breakaway spaces should double-function as library, music-listening, or "sound" rooms. This would demystify the spaces as they would, at times, be used by all children.

- Retreat areas should offer sufficient privacy and be free from excessive stimulation to allow children to regain self-control and confidence.

- Retreat areas located in places where the children can leave the focus of the group activity, without interrupting the group, or crossing their field of vision.
PLACES FOR INFORMAL SOCIALIZATION

ISSUE
Children learn a lot about each other through interactions which take place under informal circumstances. Children should have opportunities to get to know each other while at school without interactions governed by formal educational programs. Additionally, overt adult supervision can, at times, disrupt interaction among children.

DISCUSSION
A primary goal of mainstreaming programs is to foster interaction and understanding between handicapped and regular children. Because of spatial and programmatic constraints, interaction at many schools is restricted to specified time periods for designated academic activities. Other opportunities for contact between handicapped and regular children are often very limited, even at lunch or play. Although handicapped children may eat in regular lunchrooms, they are often at separate tables. Frequently, contacts in play areas are limited because of restrictions placed on the handicapped's play or handicapped children use separate sections of play areas because they enter and leave different parts of the school building. In studies of children's play, it was found that informal settings allow children to interact more freely and simultaneously. Direct adult presence can shatter the ambience needed for informal child socialization (Moore & Rose, 1976).

PRINCIPLE
Provide areas which are thought of as "informal" territories where children have the opportunity for spontaneous interaction.

RECOMMENDATIONS
- Within larger classrooms, have commons areas which are not normally used as places for structured learning.
- Provide tables and places scaled for small groups of 2-6 people.
- Have a major non-class activity, such as the library, serve as a building focal point and meeting place. Access should be easy for all children.
- Within libraries, lunchrooms, etc., develop spaces for small groups; by change of scale, providing a sense of enclosure, different lighting levels, etc.

- All children should actively share gym, lunch, and play areas.
RANGE OF ENVIRONMENTAL STIMULI

ISSUE

It is important that each person can participate in an environment that is stimulating and meaningful, without being overwhelmed. But different levels of skill, perceptual, or emotional handicaps may make an environment that is clear and interesting for some, a confusing and ill-defined place for others.

DISCUSSION

Developing an environment rich in stimuli and appropriate for everyone is a difficult task. But if handicapped children are to receive the maximum care in design considerations, one must realize what sorts of environmental stimuli they need, in some cases more developed than the average child's needs. For a perceptually impaired child, the "everyday" place cannot be simply understood and comfortably navigated without additional help. The visually impaired child needs the stimulation of the remaining sensory modalities to learn orientation and spatial organization. This can be achieved through the use of sounds, tactile cues, smells. For the completely blind, spatial depth can be judged by the use of time, the pacing off of spaces. The visually impaired child needs direct, multi-sensory experiences in a variety of modes to learn concepts.

The child with a hearing loss "will rely largely on visual stimuli for learning about their environment" (Mainstreaming children with hearing loss, pg. 50). The deaf child "periodically looks up from his toys in order to scan the environment and assure himself that changes going on around him are not threatening. This matter of environmental change is of critical importance for deaf children..." (Hewett, 1974).

For the mentally retarded child, cautions should be taken against offering too many alternatives, where the child may run from activity to activity never really learning from any single experience. Yet in offering activities for the retarded child, contact with the environment should be made simultaneously through looking, listening, touching and moving. Through this multi-sensory stimulation, "we can expect a greater probability of learning to take place" (Hewett, 1974). A child with learning disabilities
can also benefit from "increasing the stimulus value of the element to which the child's attention is to be directed" (Hewett, 1974). Though a richness and complexity of environment is often beneficial, there should be a clarity of certain physical properties. "The direct connection between cause and effect should always be made easily apparent" (Bayes, Francklin, 1971), that the light switch turns on the light, that water and sun make plants grow. "To avoid confusion, materials which stimulate others are to be avoided" (Bayes, Francklin, 1971).

All children can benefit from an awareness of the rhythms of nature; the rising and setting sun, the change of seasons, the passing of time.

Hyperactive children will have a negative response to too much stimulation, particularly if the stimuli are complex, difficult to recognize and sort.

PRINCIPLE

A rich, stimulating environment can benefit the basic abilities of all children, especially if such stimuli are direct and meaningful, used to express the nature of environment. Ensure a range of stimuli from simple, bold forms with a limited message, to a place filled with sounds, smells and textures.

RECOMMENDATIONS

- Provide solutions which employ stimuli for all the senses--visual, auditory, tactile, etc.

- Use multiple cues for orientation and organization--the use of signs, colors, level changes, to enhance understanding.

- Encourage encounters with natural elements to teach physical properties--cause and effect and nature's cycles.

- Increase stimulus value of elements to which the child's attention is to be directed--by emphasizing with color, exaggerated size, a noticeable texture, etc.

- Allow for control of stimuli--the possibility of limiting variables to reduce complexity and confusion.
ISSUE
Obtrusive movement from one activity zone to another for special instruction tends to intensify awareness of handicapped children. This tends to lead to stigma associated with the handicapped and to growth of poor self-concept on the part of handicapped children due to feelings of not really belonging to any place or group.

DISCUSSION
Even in "open classroom" school which do not divide buildings to distinct areas for most activities, resource rooms for exceptional education are designated. Movement from one activity area to another by the handicapped is often obtrusive and disruptive to interpersonal relationships among children. In mainstreaming situations, the strength of interpersonal relationships among handicapped and regular children depends on the ability of the handicapped to move easily and unobtrusively from one area to another (Bayes, 1971).

A key element of many mainstreaming programs is the absence of arbitrary scheduling. This allows each child to work on different tasks at different rates of speed, in open classroom type situations. An important concept related to scheduling in open classrooms is called "the integrated day" (Taylor, 1971). This term refers to simultaneous activities taking place in a classroom which overlap spatially and temporally. This allows all class activities to be regarded as integrated into the whole of the class experience. In mainstreamed classes, special programs for handicapped can be conducted without undue attention attracted as these programs would be conceived of as part of the integrated class activities.

PRINCIPLE
Allow for different activities, including exceptional education, to occur simultaneously within regular classrooms.

RECOMMENDATIONS
- Have several focal points within a room to allow simultaneous activities to occur in semi-private spaces.
- Designate circulation zones which permit children to move easily and unobtrusively between activities.
- Focal points should be easy to enter without intruding or confronting others engaged in semi-private activities.

- Focal points should be semi-fixed locations to give needed sense of structuring to some handicapped children.
ISSUE
Since children who are physically handicapped have the same educational needs as able-bodied children, it is obvious that restricting or barring them from activities by creating—or not eliminating barriers in access, circulation, and equipment amounts to stunting their development beyond the problem their handicap may imply.

DISCUSSION
Children who have a handicap must be allowed and encouraged to develop as normally as possible, and to do this they must have access to all opportunities other children have. Further, they must have access to other children, both handicapped and able-bodied. Research reported in Alexander, Ishikawa, and Silverstein (1977, pp. 334-343) has shown that a child's peer group may be even more important than their parents to healthy emotional development. This is especially true for handicapped children.

While not a developmental argument, one very compelling reason for creating a barrier-free environment is that it is required by law.

PRINCIPLE
Barrier-free environment

RECOMMENDATIONS
• Use ramps instead of, or in conjunction with, steps for children in wheelchairs or with braces, crutches, etc.

• Circulation paths should be of a continuing common surface; steps and/or abrupt changes are to be avoided; they should be 5'0" wide to allow wheelchairs to pass; and gradients should not exceed 5%.

• Ramps must not have a slope greater than 1'0" of rise in 12'0" of run, and should be a nonskid surface; width should be 4'0" at least; all ramps must have handrails on each side to fit children's reach, about 16"-24" above ramp. When appropriate, two parallel handrails should be used.
- All stairs should have rounded nosing; riser 5-3/4" and tread 14"; handrails should be of the height described in the preceding recommendation.

- Children should be able to easily move from the indoor activity area to transportation pick-up points.

- Use signage with raised letters at a height children can reach. Both handicapped and able-bodied children will benefit from this.
### ISSUE
Approaches toward teaching in mainstreamed settings vary in order to accommodate different situations. Different teaching strategies are used according to subject matter and objectives. Teaching strategies also vary in accordance with the types and severity of handicaps being dealt with. Large, open classrooms are not always suitable for supporting teaching objectives or the needs of children.

### DISCUSSION
Many teachers have become oblivious to teaching environments, or say that the spaces in which they teach do not make any difference. It is suspected, however, that these statements are due to feelings that teaching spaces are predetermined and not modifiable (Blacklow, 1971). One study indicated that teachers believe that their effectiveness would improve if they were given the opportunity to manipulate scale and usability of teaching space (Abeson, Blacklow, 1971).

In mainstreaming, it is desirable to keep handicapped and regular children together as much as possible. It is suggested in other design principles that handicapped instruction be conducted in the same areas as regular teaching as much as possible. However, there are circumstances when teaching handicapped children in close, intimate areas can contribute more to teaching effectiveness and children's emotional security.

Many emotionally disturbed and mentally retarded children need to retain a sense of enclosure in order to feel secure. Large classrooms are sometimes ineffective for working with these children. These spaces may be too big, too open, or have too much activity (Bayes, Francklin, 1971).

### PRINCIPLE
Within each school, provide a range of sizes of teaching areas. In addition to large classrooms, provide smaller spaces for groups or intimate areas for individual instruction.
RECOMMENDATIONS

- Have at least 3 sizes of teaching areas: classrooms, small group/seminar areas, private instruction areas.

- Allow for movable partitions to create designated temporary small-scale spaces within larger rooms.

- Use corners of classrooms for individual instruction.
ISSUE

Exceptional children often have poor self-identity because of slow development of their abilities to make and exert personal choices.

DISCUSSION

In most classroom situations, a traditional governing principle is that individual desires and preferences must conform with class standards. A typical problem among handicapped children is poor development of their self-concept and self-identity (Bayes, Francklin, 1971). Therefore, it is important that each child be given some area or object which they may establish territorial defense over (Hall, 19 ). Giving each child something which becomes "their own" encourages them to assert personal choice over how their territories are to be used, arranged, and decorated. This results in increasing children's awareness of their individuality and growth of their self-concept and self-esteem.

PRINCIPLE

Provide opportunities to claim and maintain personal "territory" or objects which are to be recognized as belonging to particular individuals.

RECOMMENDATIONS

- Provide places in the classroom which children can establish as their personal territories and be used for individual work, meditation, or retreat.
- Individual cubicles or closets should be provided for children to store and display personal objects.
- Individual pin-up boards can be used to display good work, drawings or any other items which a child thinks relates his own feelings of identity.
UNOBTRUSIVE OBSERVATION

ISSUE

It is important that visitors may make observations of activity areas, without disrupting the activity or altering behavior by their presence.

DISCUSSION

A chance to observe the class settings and activities can provide one with valuable information which cannot be fully communicated by other means. However, such observation should not interfere with the normal proceedings of the classes.

Teachers, parents, and administrators can all benefit from unobtrusive looks into the classroom. Parents need the chance to watch their children in settings outside the home, to see how they learn, work, and interact with others. Teachers can be introduced to new methods and watch how they work.

One critical point is to ensure that the children don't feel that they are being watched and that their activity isn't altered by the presence of adults. In order to ensure this, the place from which observation takes place should be removed, remote, or concealed from the activity area.

PRINCIPLE

Allow visitors to watch and listen in on activity areas without entering or conspicuous peering in.

RECOMMENDATIONS

- Concealed observation: build in an observation gallery with one-way mirrors between activity areas. The gallery should be darker than the outside room, and have writing surfaces and places to sit. (Abesol Blacklow, 1971)

- Remote observation: if a definite physical solution is not possible, an area could be set aside— at the entrance, to the side—where groups can quietly gather to observe.

- Removed observation: closed circuit TV may be used in difficult cases.