

ELEMENTARY AND SECONDARY SCHOOLS

PROGRAMMING AND PLANNING GUIDELINES

Most state departments of education, as well as many organizations, have developed standards to guide the planning, design, and construction of school facilities. These standards vary, reflecting the learning process and curricula for different age groups, as well as for children with special needs. Representative program guidelines for the four most common types of school are included:

- Kindergarten and preschool
- Elementary school
- Middle (or junior high) school
- High school

DESIGN STANDARDS

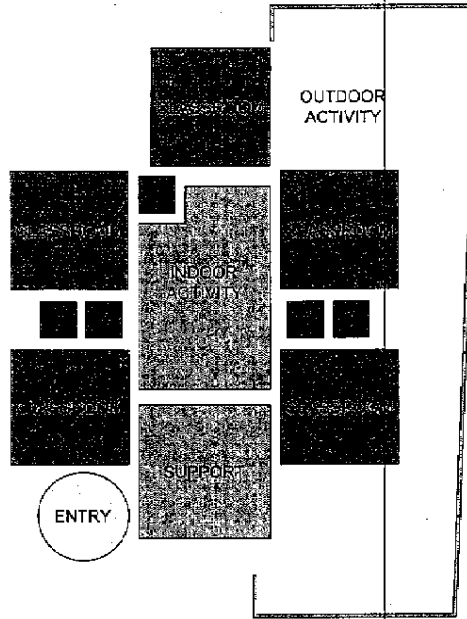
In the United States, the primary source of standards—other than state or local regulatory departments—is the National Association for the Education of Young Children (NAEYC) in Washington, DC. NAEYC issues the most widely used accreditation standards for programs for children from birth to eight years, standards that are often higher than state licensing standards.

Kindergarten and Preschool

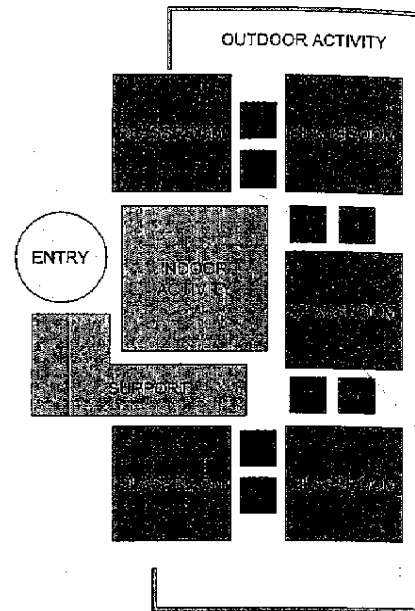
Kindergarten typically is a child's first introduction to school, or marks a transition from another preschool program, nursery school, Head Start, certain forms of day care, or any of the many other types of early childhood programs. In most school systems children enter this program at age five or six, but a growing number of states are mandating early childhood programs for younger ages.

Kindergarten generally is defined as a form of preschool education in which children are taught through creative play, social contacts, and natural expression. The concept was originated in Germany in 1837 by Friedrich Froebel. *Kindergarten*, "child's garden," was based on the idea that children's play was significant. Froebel employed games, songs, and stories to address the needs of children (at that time generally ages three to seven). The kindergarten served as a transitional stage from home to school and often was a child's first formal learning experience. In 1861, American educator Elizabeth Parmer Peabody opened the first kindergartens in the United States, in Boston. By the 1920s, kindergartens were included in public schools in most parts of the United States.

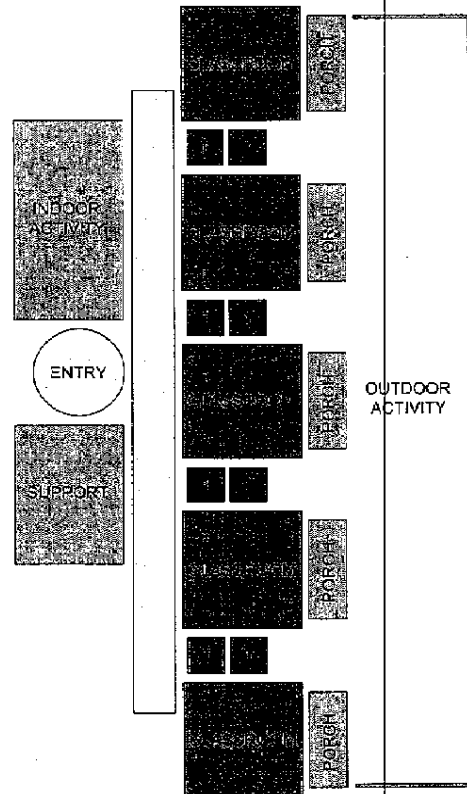
Historically, a child's first day at kindergarten was often his or her first formal learning experience away from home, but today more children have been exposed to other forms of preschool programs or child care. Thus, the issue of separation from home and parents must be considered, as well as the transition to a group social environment in which the child usually does not know the other members.



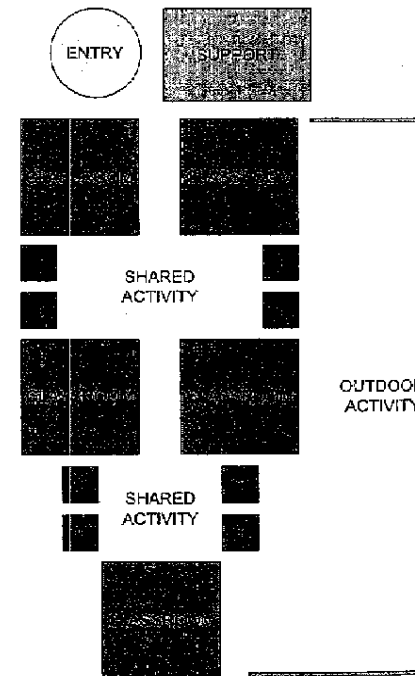
CLUSTER MODEL—FOCUS ON THE INTERIOR
The interior cluster model is organized around open play space.



CLUSTER MODEL—FOCUS ON THE OUTDOOR
The outdoors cluster model is organized around common services and corridor.



LINEAR MODEL
The linear model is organized along an interior spine; focus on the outdoors and covered porches at each classroom.



HYBRID LINEAR MODEL
The hybrid linear model is organized along a corridor spine made up of a series of activity and play spaces.

KINDERGARTEN AND PRESCHOOL PLAN ORGANIZATIONS

DEVELOPMENTAL GUIDEPOSTS FOR CHILDREN AND ADOLESCENTS

RANGE	PHYSICAL	EMOTIONAL	SOCIAL
Childhood (3-5)	<ul style="list-style-type: none"> • Body growth slows, more adult proportions develop. • At 6, neural development 90% complete. • From 4 to 8 years, lymphoid development increases from 40 to 90%. • Most children are farsighted. • Muscle development begins at 4 years, but larger muscles dominate. 	<ul style="list-style-type: none"> • Tendency to fear imaginary or anticipated dangers. • Crying and tantrums diminish; anger can be expressed in words (often by threatening or yelling). • Anger directed at cause of frustration, retained for longer periods of time; but 4-year-olds begin to seek ways to hide it from others. • Channeling anger and frustration is important. 	<ul style="list-style-type: none"> • Begin to understand concept of taking turns and tend to imitate adults. • 4-year-olds prefer to spend time playing and cooperating with others and can pick up social cues from surroundings. • 5-year-olds prefer to play with others. • May create imaginary playmates if deprived of contact with other children, but most will outgrow these playmates by age 5.
Middle Childhood (ages 6-9)	<ul style="list-style-type: none"> • Apparent difference between growth rate of girls and boys (girls closer to end growth states, boys taller and heavier). • Nearsightedness may begin to develop at 8 years. • 6-year-olds use whole bodies for activities, and large muscles are more developed; 7-year-olds more cautious and show ease with fine motor skills; 8-year-olds develop fine motor skills and have increased attention spans. • Nervous habits begin to appear at age 7. 	<ul style="list-style-type: none"> • 6-year-olds begin to assert independence and demonstrate confidence. • 6-year-olds fear the supernatural. • 7-year-olds are more stable, narcissistic, polite, responsive, empathetic, less aggressive, and can draw connections between cause and effect. • 8-year-olds demonstrate greater independence, vacillate between moods, and begin to sense how others feel about them. • 7- and 8-year-olds discover some of their limitations and may hesitate to try new tasks, but 8-year-olds seek to create an external image of competence and confidence. 	<ul style="list-style-type: none"> • Family influence decreases, peers are more important, teachers become authority figures. • 6-year-olds have many internal conflicts, resulting in capriciousness. • 6-year-olds choose playmates on qualities of age and size (not gender or ethnicity); 7-year-olds are more aware of social status or ethnicity differences among themselves. • 7-year-olds are self-critical and often disassociate themselves from frustrations. • 7-year-olds are well mannered unless bored; 8-year-olds are more developed socially. • 7-year-olds are more conscious of position among peers; boys and girls play separately. • 8-year-olds prefer company and approval of peers, and exhibit more self-control and modesty.
Late Childhood (ages 9-11)	<ul style="list-style-type: none"> • More resistance to disease. • Steady increases in body measurements: height and weight (girls more than boys), and muscle growth. • Have fine motor skills. • May feel uncomfortable with scrutiny. • Many girls begin showing signs of puberty. 	<ul style="list-style-type: none"> • Fear exclusion from peers. • Prone to outbursts but try to control them. • 10-year-olds are mild tempered, seek reassurance from others; anger comes and goes quickly. • 10-year-olds fear heights and dark. • 11-year-olds fear school, friends, for parents' welfare, strange animals, threatening world events; are more easily angered, often resulting in physical violence, but can control outbursts more appropriately. 	<ul style="list-style-type: none"> • Socialize in exclusive groups with own sex (boys' groups gravitate toward shows of bravado and competition; girls' groups are well structured and more concerned with maturity). • Develop important individual friendships, which are often fluid. • Ties to family less important than ties to peers; adult shortcomings looked at critically, often leading to conflicts.
Early Adolescence (ages 12-14)	<ul style="list-style-type: none"> • Enter pubescence, puberty, and postpubescence. • Activate primary and secondary sex characteristics. 	<ul style="list-style-type: none"> • Emotions vacillate; responses are inconsistent. • 12-year-olds may develop a derogatory sense of humor to control emotions. • 13-year-olds withdraw from others, tending toward secrecy and sullenness. • 14-year-olds use derogatory humor as defense and primary form of communication. 	<ul style="list-style-type: none"> • Motivated by desire to fit in with peers, which prevents individual expression but emboldens adolescents to assert independence from home. • Peer groups are exclusive and develop from single-sex to coed. • Intensely drawn to a best friend, believing that only this other person understands.
Late Adolescence (ages 15-18)	<ul style="list-style-type: none"> • Height and weight stabilize. • Girls generally physically mature by 18, boys by 19. 	<ul style="list-style-type: none"> • Feel restrained or controlled by adults. • Have insecure self-image; may fear inadequacy. • Focus attention on opposite sex or close peers. • Feel challenged to find comfortable self-image. 	<ul style="list-style-type: none"> • Assert independence; have power struggles with parents; are most concerned about social life. • If uncomfortable with adulthood, may withdraw to former behaviors.

As a child grows, he or she typically learns in different ways, and the physical environment of the school should reflect this characteristic.

KINDERGARTEN DESIGN CONCEPT

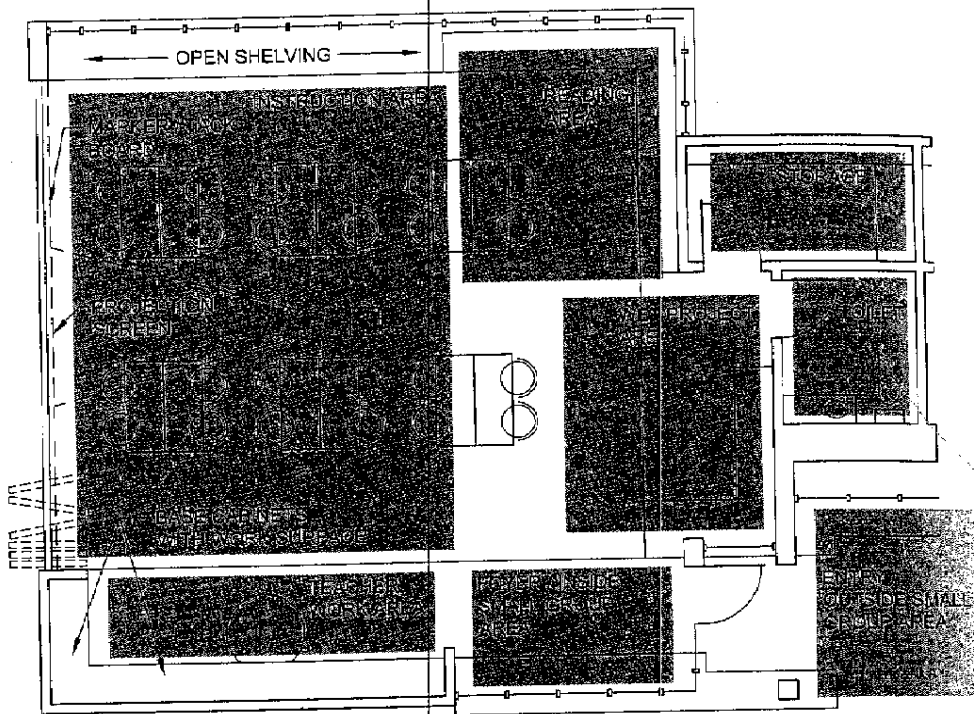
The design of schools for early childhood education has always been geared toward comfortable, supportive, and adaptive settings that are conducive to a learning process derived from familiar play and hands-on activities. Specific features associated with home, as well as school, are considered in developing an appropriate transitional setting. The type, size, scale, and variety of more public and private spaces underlie appropriate design and planning.

Much like a house, containing public spaces (living room, parlor, foyer, family room) and more private spaces (kitchen, upstairs bedrooms, bathrooms, etc.), a school should create spaces for comfortable retreat and quiet, reflective play, as well as for small and large group activities. Today, the typical age of children in kindergarten programs ranges from four to six years.

Among the general goals that all early childhood and kindergarten programs should strive to achieve are the following:

- Create a visually rich, fun, and surprising environment.
- Provide spaces and surfaces for display of children's work.
- Provide a variety of settings for work-in-progress.
- Introduce a variety of social settings for small and large groups.
- Make strong connections between the indoors and the outdoors; above all, use daylighting as much as possible.
- Connect spaces to promote communication, orientation, and flexible programming and staffing.
- Build in flexibility of space to accommodate evolving teaching practices.
- Create a distinctive, pleasing entrance.
- Pay special attention to the scale and height of typical elements such as windows, doors, doorknobs and pulls, sinks, toilets, counters, furnishings, mirrors, steps, shelving and storage, light switches, towel dispensers, and other accessories.

Access to kindergarten programs typically is through the public elementary school system, but there are many other options, such as child care centers, day schools, and private elementary schools. Minimum space standards for early childhood education and kindergarten programs have historically been determined by state regulation, often by the U.S. Department of Public Welfare, for child care centers and day schools, or by the U.S. Department of Education, for programs that are components of public schools. Most minimum space standards are based on a square-foot allowance per child, but these standards can vary from state to state.



This classroom (1,000 sq ft (92.9 sq m); 24-student capacity) accommodates a variety of group and individual activities with specific areas for instruction, group reading, wet projects, and small groups.

KINDERGARTEN AND GRADE 1 CLASSROOM

The Physical Environment

The indoor and outdoor environments must be safe, clean, attractive, and spacious. There should be enough usable space indoors so children are not crowded (a minimum of 35 sq ft (3.2 sq m) of usable playroom floor space indoors per child and a minimum of 75 sq ft (6.9 sq m) of play space outdoors per child). Program staffs must have access to the designated space and sufficient time to prepare the environment before children arrive.

Activity areas should be clearly defined by spatial arrangement. Space is arranged so that children can work individually, together in small groups, or in a large group. Clear pathways must be provided for children to move from one area to another and to minimize distractions.

Preschool Design Concept

The space for children three years and older should be arranged to facilitate a variety of small group and individual activities, including block-building, sociodramatic play, art, music, science, math, manipulatives, and quiet reading and writing. Other activities such as sand play and woodworking are also often accommodated. Carpeted spaces as well as hard surfaces, such as wood floors and ample crawling and toddling areas, are typically provided for infants and young toddlers. Sturdy furniture is required to enable nonwalkers to pull themselves up or balance themselves while walking. School-age children should be provided separate space that is arranged to facilitate a variety of age-appropriate activities and permit sustained work on projects.

Children's Equipment

Age-appropriate materials and equipment of sufficient quantity, variety, and durability should be readily accessible to children and arranged on low, open shelves to promote independent use. Individual spaces for children to store their personal belongings should be provided.

Private Areas

Private areas should be made available indoors and outdoors so that children can have occasional solitude. Soft elements such as rugs, cushions, or rocking chairs should be provided for the comfort of the child, in addition to sound-absorbing materials to minimize noise.

Outdoor Areas

Outdoor areas include a variety of surfaces, including soil, sand, grass, hills, flat sections, and hard areas for wheeled toys. Outdoor spaces include shaded, open and digging area; outdoor equipment should enable riding, climbing, balancing, and individual play. The outdoor area is protected by fences or by natural barriers from access to streets or other dangers.

Staff Work Area

The work environment for staff should include a place for adults to take a break or work away from children, an adult-size bathroom, a secure place for staff to store their personal belongings, and an administrative area that is separated from the children's areas for planning or preparing materials.

KINDERGARTEN AREA REQUIREMENTS

The required space standards for kindergartens often fall short of those recommended by social and behavioral research, in both quantity and arrangement of space. Facilities with too little space (less than 35 usable sq ft (3.2 sq m) of space per child) may lead to more aggressive and destructive behavior, fewer friendly contacts, and less solitary learning and play. Conversely, too much space (more than 50 usable sq ft (4.6 sq m) of space per child) can result in reduced attention spans, more supervision required by staff, and an increase in aimless, random behavior.

Outdoor Activities

The amount of recommended space for outdoor activity can vary significantly. It is best to provide at least the minimum required space, rather than no outside space at all. Compensation for lack of outdoor space with additional indoor activity space, in equal proportion to the outdoor requirement, is acceptable. Given the constraints of building sites, particularly in urban or inner-city locations, outdoor space may not be possible. In such situations, designers must find inventive solutions to enable access to fresh air and sunlight. Any outdoor space, however small, can be important, providing release to the children and offering a broad range of educational opportunities, even if they do not satisfy requirements for an outdoor area.

Entrance

The main entrance should be a welcoming, spacious area with adequate seating and places for informal visiting. It should be large enough to accommodate small groups of children and adults. This is often the place where children exhibit signs of anxiety over separation from parents. Display areas for bulletins and children's projects can be provided at both adults' and children's eye level. Ideally, the entrance should be close to administrative areas to provide security and to accommodate parent-teacher meetings.

Administrative Space

Administrative areas should be located near the entrance for easy access by families and for view of the main entrance. Administrative areas usually include a director's office with adequate space for a small meeting table, staff mailboxes, a small meeting room, space for records storage and supplies, space for a small quiet room and first-aid room, and a staff workroom and break area with bathroom.

Corridors and Transition Spaces

Corridors can be viewed as extensions of activity space. Avoid long, straight hallways by providing nooks and alcoves for sitting, play, and display. Provide space for wall and ceiling-hung projects, and display cases for various art objects. Design open corridor spaces with interior glass windows looking into adjacent classroom and activity spaces; take advantage of borrowed natural light. Avoid designing corridors to have no other use but circulation. Use carpeting or other acoustic materials to reduce noise.

Classrooms

A well-designed classroom environment is safe for children, supports their emotional well-being, stimulates their senses, and challenges their skills. Subdividing the classroom into well-defined "activity pockets" identifies physical spaces each of which is functionally limited to one activity but not completely closed off from the rest of the classroom or instructor supervision. Observation of preschool children at play suggests that they have a tendency to cluster into small groups of fewer than five, with a mean of about two children. If activity areas are sized for two to five children and an instructor, they should range between 40 and 60 sq ft (3.7 and 5.5 sq m) each. In addition, space should be provided either within the classroom or in a nearby area to allow for an entire class to meet as a single group.

The optimum class size is approximately 20 children per classroom. Select finishes to help reduce noise (think in terms of 20 children at active play). Create areas for distinct activities: for example, group meetings; quiet individual concentration; laboratory and semiactive spaces; workshop and studio spaces for art, drama, blocks, games, and so on. These areas are best created through the use of movable furnishings, shelves, bookcases, and so forth, to promote flexibility and the individual character of each classroom. Rectangular spaces are typically easier to configure than square or oddly shaped areas.

Design space to meet both children's and adult's physical needs. Be sure to provide seating, tables, workspace, and storage suited to both. Provide space for cubbies and lockers, either between classrooms or within classrooms; allow for adult assistance. Provide for display of plants and objects. Take advantage of areas below windows for quiet seating nooks or play areas. Provide a play area specifically suited to wet or messy activities.

Personalization, Display, and Storage

Providing inventive and creative ways to display the work and projects of the children is essential to support their "habitation" of the space. Every part of the architecture should be thought of as potential display space; use walls, ceilings, floors, and furnishings throughout the facility. Care should be taken to provide a variety of display spaces for two-dimensional flat work and three-dimensional pottery, mobiles, sculpture, and small crafts. The display area should be flexible and allow for quick and easy alteration. A display space should be designed for viewing by both adults and children. Appropriate lighting should emphasize the displays and should be adjustable in both position and intensity. The following are suggestions for display spaces:

- Install picture rails or shelves along walls. Give particular attention to corridor areas, where walls may become repetitive.
- Arrange closed display cases for viewing from one side or from all sides.
- Make use of windowsills or areas in front of windows where natural light and the interplay of light and shadow can enhance the objects viewed.

RECOMMENDED MINIMUM SPACE REQUIREMENTS FOR KINDERGARTEN AND PRESCHOOL

Direct activity/classroom space	42 sq ft (3.9 sq m)/child
Staff support/storage space	38 sq ft (3.5 sq m)/child
Observation space (often used by parents or staff)	9 sq ft (.83 sq m)/child
Subtotal assignable space	89 sq ft (8.26 sq m)/child
Nonassignable space, "multiplier"*	20 sq ft (1.8 sq m)/child
Total facility space/child	109 sq ft (10 sq m)/child
Outdoor activity space	75-200 sq ft (6.9-18.5 sq m)/child

*The multiplier is applied to the program area to account for circulation, wall thickness, miscellaneous support spaces, and so forth, but may not include adequate space for mechanical/electrical equipment depending on the system selected.

Source: Campus Child Care News 11(1), January 1996.

SPACES IN SAMPLE FACILITY PROGRAM FOR KINDERGARTEN

PROGRAM SPACE	AREA SQ FT (SQ M)
Entry area	200 (18.5)
Program assistant's/reception area	120 (11.1)
Administrative assistant's office	120 (11.1)
Director's office	160 (14.8)
Administration copy/supply room	100 (9.3)
Staff workroom/break area/toilet	350 (32.5)
Meeting/parent conference room	200 (18.5)
Quiet room/first aid	100 (9.3)
Kindergarten classrooms (5 @ 800 sq ft (74.3 sq m) each) (Classroom area includes storage, cubbies, kitchen, etc.)	4,000 (371)
Classroom bathrooms (5 @ 80 sq ft (7.4 sq m) each)	400 (37.2)
Central activity/dining area	1,500 (139.3)
Central activity storage	200 (18.5)
Art studio (with kiln)	500 (46.4)
Art studio storage	60 (5.5)
Kitchen/food storage	600 (55.7)
General facility storage	200 (18.5)
Subtotal usable space	8,810 (818.5)
Multiplier for circulation, mechanical area, etc. @ 1.2	1,760 (163.5)
Total Facility Program (average @ ±106 sq ft (9.8 sq m)/child)	10,570 (981.9)

Kindergarten program for 100 children.

Kitchen and Pantry

A kitchenette can serve a group of classrooms or the entire school area, with counters and cabinets at heights for both children and adults. Locking cabinets should be specified. Locate the kitchenette for easy and secure delivery access and so that it is adjacent to the dining area. If possible, allow for a clear view from the dining area with interior windows, to promote child-staff interaction and learning. Arrange space to allow for display cooking. Ensure that adequate ventilation is provided.