

Children's Blocks and Constructive Play
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It's been more than two hundred years since Friedrich Froebel introduced wooden shapes for children to explore, take apart, and put together. Since then, wooden blocks have been shown to aid the development of young children. Jean Piaget's theory of stages, for instance, tells us that children develop social, physical, and logico-mathematical knowledge through playing with manipulative materials such as blocks.

In the United States, block play took off at the beginning of the last century, through the pioneering work of Caroline Pratt, a New York City teacher who was frustrated by the "repressiveness of formal education"—and excited by the possibilities of letting children learn through constructive, open-ended play.

When children play with blocks, they are practicing mathematical skills. In selecting blocks of different sizes and shapes and comparing surface volumes and areas, for example, they are unwittingly using classification and seriation (Hirsch, 1996). Cleaning up involves math too: sorting identical and dissimilar shapes, and organizing by size (Henniger, 1987).

Because it involves measuring lengths, widths, and heights (if only by eye), block play develops a child's ability to mentally visualize relationships. Such manipulations are similar to those used in geometry and algebra during the child's later school years (Henniger, 1987).

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Constructive block play also involves the use of spatial configurations (Reifel, 1983), a vital aspect of mathematics and science generally (Casey, Pezaris & Nuttal, 1992). A study that evaluated the wooden block constructions of four-year-olds (in 1982) and compared them with their test scores in high school (in 1998) supported the hypothesis that a child's ability to create complex block constructions can predict mathematical ability. Interestingly, the study found a difference in achievement levels between boys and girls only when the boys were given greater exposure to blocks. When both were given equal - opportunities to develop their skills, there were no gender-related differences (Stannard, Wolfgang, Jones, and Phelps, 2001).

In short, wooden unit blocks do not only afford long-lasting play, but also fundamental educational lessons that will be invaluable in later life.

Because of this, adults who work with young children would do well to learn the names of geometric shapes, the built-in mathematical concepts their children will draw on in playing with blocks, and the developmental stages exhibited by children during play. Unit blocks ought to be an integral part of every childhood.

States of Block Building:

Based on Harriet Johnson's research in 1933

Stage 1:

Younger children carry blocks but don't use them for construction. Older children often skip this stage and instead examine the block's surfaces and textures with their eyes and fingers. In this stage, we see the familiar gather-and-dump activities of toddlerhood. As they gather blocks, these young learners are gaining hands-on, sensory information on math concepts like more, less, few, many, and heavy. They are learning about texture and balance while refining their large and small motor skills.

Stage 2:

Building Begins. Children mostly make rows, either horizontal (on the floor) or vertical. There is much repetition in this early building pattern, which is basic functional play with blocks. Usually children use similarly shaped and sized blocks for these constructions and may cover the floor with long snakes of blocks. Early block stacks are irregular and threaten to topple as each new block is added. With developing dexterity, the stacks become straighter and taller.

Experimenting with stacks and towers is repetitious. Most children need to practice a task over and over to refine skills and reinforce confidence. Eventually rows and stacks reflect a child's strides in imagination and construction skills.

Stage 3:

Bridging: children create a bridge (or portal) by using two blocks to support a third. In architecture this is known as the post-and-lintel system. This stage reflects a child's ability to solve a complex mathematical problem that involves spatial relationships. For example, how far apart do two support blocks have to be to support a third? Experimentation, perseverance, observation, and access to a variety of block sizes eventually lead to elaborate bridge-on-top-of-bridge structures.

Stage 4:

Enclosures: children place blocks in such a way that they enclose a space. Bridging and enclosures are among the earliest technical problems children have to solve when playing with blocks, and they

occur soon after a child begins to use blocks regularly. Usually early enclosures are skewed—blocks aren't parallel or square to each other. Experimentation and practice lead to eventual success in making enclosures. And once successful, children repeat and refine the process. They may play with embellishments like building a series of joined enclosures, changing the shapes and sizes of the enclosures, creating circular enclosures, or developing patterns of enclosures.

Stage 5:

With age, children become steadily more imaginative in their block building. They use more blocks and create more elaborate designs, incorporating patterns and balance into their constructions and begin to explore symmetry. In this stage, children are not likely to name their structures. They are building for the sake of building, and not for dramatic play. Young builders are refining their skills, strengthening their understanding of spatial relationships, and enjoying their own creative impulses.

Stage 6:

Naming of structures for dramatic play begins. Before this stage, children may have named their structures, but not necessarily based on the function of the building. This stage of block building corresponds to the "realistic" stage in art development. Children realistically name their structures—a barn, horse corral, skyscraper, or spaceship, for example.

Stage 7:

Children use blocks to represent things they know, like cities, cars, airplanes, and houses. They also use blocks to stimulate dramatic play activities: zoo, farm, shopping center, and other locations. Children realistically name their structures—a barn, horse corral, skyscraper, or spaceship, for example. In this stage, children rely on access to a large number of blocks in a variety of shapes. They repeat earlier stages—building bridges and enclosures—with deliberate purpose. Their block play is artistic. The blocks are the medium they use to represent structures in their experience—stairs, towers, and gardens. With continued access to blocks and time to experiment, children begin to reflect their understanding of symbols. They use blocks to represent objects in the real world and often interweave block play with dramatic play. Children may announce their building plan before taking the first blocks from the shelf, and assign roles to each cooperative builder.