

# Infants and Toddlers Block Play: STEM in the Blocks Center

regentsctr.uni.edu



## PURPOSE OF BLOCK PLAY IN THE INFANT- TODDLER CLASSROOM



Blocks are timeless, classic play materials that have endured as an activity through many different ideologies and beliefs and theories of child development. Playing with blocks provides endless opportunity for the development of emerging perceptual-motor skills (Hendrick & Weissman, 2006, p. 65).

Blocks can be an integral part of the learning environment throughout childhood beginning with infants and toddlers. Babies are intrigued by blocks. They love to hold them in their fists, mouth them, and bang them together. By the time they are 6 months old, they can be endlessly engaged in a game where a block is partially hidden under a blanket so that the infant can retrieve it. As they develop the ability to sit, stand, and move, babies can have prolonged interest when adults vary the number of blocks, the types of blocks, and the area in which the baby plays with them.

As toddlers develop more muscle control, they learn to stack and line up the blocks. They reveal their developing cognitive skills as they attempt to build basic structures by combining the blocks together. At around eighteen months, toddlers begin displaying their creativity and imagination (Sarama & Clements, 2009) such as holding two colored window blocks in front of their eyes and looking through them to suggest glasses. Adults can support the development of children ages twelve to twenty-four months by imitating what they do and then adding subtle variations in order to invite further explorations (Kamii, Miyakawa, & Kato, 2004).

As children grow and develop in their block play, their understanding of the complexity of blocks and how they compare and contrast to one another is enhanced. Their developing understanding of and familiarity with the materials enables them to construct more elaborate and complex structures: the foundations of science, technology, engineering, and math skills.

## WHAT DO INFANTS AND TODDLERS DO WITH BLOCKS?

- Bat at blocks before they are able to grasp
- Reach for blocks that are placed in proximity to their play area
- Manipulate and feel blocks with hands
- Grasp
- Pass from hand to hand
- Bang two blocks together
- Put blocks in mouth
- Engage in volumetric block play
  - Dumping out a tub of blocks
  - Placing blocks in containers (such as tubs, baskets, or muffin tins)
- Carry blocks around the room
- Drop blocks repeatedly and watch them fall (especially if in a high chair)
- Look for a hidden block (approximately 8-12 months)
- Knock over block structures erected for them
- Stack blocks as high as they can and knock them over (toddlers)



# Infants and Toddlers Block Play: STEM in the Blocks Center

regentsctr.uni.edu



## WHAT ARE INFANTS AND TODDLERS LEARNING WHEN ENGAGING IN BLOCK PLAY?



Block play is a rich context for physical development as well as cognitive, math, science, and social-emotional learning. Infants and toddlers practice eye-hand coordination when they reach for and grasp, knock down, or stack blocks. They develop both **fine and large motor skills** as they figure out how to grasp, bang, stack, and carry blocks.

When adults play with blocks with infants they promote the development of **object permanence** (the understanding that objects continue to exist even when they cannot be seen, heard, touched, smelled, or sensed). The development of cognitive skills continues as infants and toddlers play with a variety of blocks. They encounter the **science** of physical properties as they mouth, grasp and manipulate, drop, or bang different kinds of blocks together to make interesting sounds. Toddlers experience the effects of gravity and balance; cause and effect.

Infants and toddlers engage in **mathematics** as they begin to notice likenesses and differences, begin matching, grouping, classifying, and organizing. They grapple with spatial thinking as they place blocks on, under, in front of, and behind each other. Babies begin stacking objects at one year, which demonstrates the infant's understanding of the spatial relationship of "on" (Kamii, Miyakawa, & Kato, 2004). The "next-to" relationship develops at about 18 months and two-year-old toddlers begin to place blocks on or next to the block previously placed (Stiles-Davis, 1988). Two-year-olds appear to understand that blocks do not fall when stacked carefully on one another (Kamii, Miyakawa, & Kato, 2004).

The ability to construct a tower that uses the builder's knowledge of balance has been linked to high performance in math and science starting in middle school. Children who work with blocks in the early years outperform their peers who have not had these experiences in math and science because of all of the mathematical concepts that can be addressed through block play.

Finally, through block play, infants and toddlers can exhibit their developing **emotional regulation** when they show surprise and anticipation when the blocks are introduced or when they are able to calm themselves when frustrated. Block play provides many opportunities to develop problem solving skills, the power of imagination, persistence, and confidence in their ability to create.

## STAGES OF INFANT AND TODDLER BLOCK PLAY

**Stage 1: Discovering** During this stage infants and young toddlers learn about the properties of blocks by mouthing, touching, moving, holding, and feeling them.

**Stage 2: Carrying** Carrying typically begins in children under the age of two. During this stage blocks are generally not used for construction. Children carry blocks around from place to place, explore them with their senses (touch, sight, taste), hit blocks together or against other objects to explore sound, and dump them in piles from containers filled with blocks.

**Stage 3: Stacking** The number of blocks that a child can stack is correlated with their level of motor development. A 15-month old can stack 2 blocks, an 18-month old at least 4 blocks, and a 24-month old can stack 5 or more blocks. Stacking may:

- be either vertically in towers or horizontally in rows (demonstrating relationship of **on** and **next to**)
- be haphazard
- be meticulous (demonstrating toddler is noticing congruence)
- be in multiple rows and towers
- resemble floors and walls
- show flexibility in integrating parts of the structure



# Infants and Toddlers Block Play: STEM in the Blocks Center

regentsctr.uni.edu

## WAYS ADULTS CAN EXTEND THE LEARNING IN BLOCK PLAY

Adults can be the most effective in their teaching when they are aware of infants' and toddlers' developmental levels and previous experiences. This begins when they provide an environment that inspires infant and toddler interests and ideas and allows them to try out their ideas. Suggestions to create such an environment include:

- Provide a stable, flat surface such as a low table or floor for building that allows play to grow.
- Add loose parts that entice toddlers to engage in a variety of play scenarios.
- Add farm animals, construction vehicles, plastic food, and baby dolls to the block area.
- Post pictures of buildings or structures on the wall in the blocks area.
- Keep out only a number of blocks that toddlers can put away on their own or with minimal help.
- Provide woven baskets or other attractive containers for ease of clean up.
- Provide containers of various sizes for dumping and filling blocks.
- Take digital pictures of toddlers as they build structures and display them where the toddlers can easily see.
- Add pictures of children to cylindrical blocks to encourage interest in the blocks center.
- Know when to make comments and ask questions and when to sit quietly to observe.



## COMMENTS AND QUESTIONS FOR ADULTS TO CONSIDER

### COMMENTS

Let's see what happens when you \_\_\_\_\_.

Look how high that is. I wonder if they could go higher.

Oooh, you stacked that one on top. Now there are 1-2-3-4-5-6 blocks on the tower.

I wonder what would happen if you turned that piece around and tried again.

I see you playing here often. You really like this center.

You are putting all of the red blocks in one bucket. You're sorting! It looks like the blue blocks are going into the basket. You have lots of blocks in your pile!

You look upset about something. How can I help you feel better?



### QUESTIONS

Could you do this in another way?

Can you find one to use with this?

How are these things the same?

How are these different?

Can you find one that can.....?

Could you make another one like it? Bigger? Smaller?

What did you do first?

What else could you find that might work?

That's a problem! What can you do about it?

What happened to all of these?

Which pieces did you use to make that?

Do you think you can make that go higher?

# Infants and Toddlers Block Play: STEM in the Blocks Center

regentsctr.uni.edu

## KINDS OF BLOCKS AND MATERIALS TO CONSIDER IN AN INFANT (0-12 MONTHS) AND TODDLER (12-36 MONTHS) BLOCK CENTER

Age	Needs
<b>Infants (0-9 months)</b>	Selection of blocks with various sizes, weights, textures, & colors Enticement from adult or older play partner to engage in sensory motor play Soft cloth, vinyl, or foam blocks that won't hurt when mouthed and can be washed after use Containers such as cans or boxes that can be filled with blocks and dumped (over & over)
<b>Mobile Infants (6-12 months)</b>	Not too many – enough to make a short stack or dump and to invite exploration Rotate kinds of blocks regularly to provide a range of block sizes, shapes, & types Blocks in different shapes that they can grasp Containers to drop blocks into
<b>Young Toddlers (12-24 months)</b>	Large, soft foam blocks for stacking & knocking down Large interlocking blocks such as Mega Bloks® or Duplos® Thin plastic boxes or empty cardboard cartons or boxes that can be knocked down Medium-sized wood blocks in a variety of shapes & colors Wagons for hauling Buckets/baskets for carrying Boxes to pile the blocks Suitcases or briefcases to pack the blocks
<b>Older Toddlers (24-36 months)</b>	Protected block area so children can build & save their structures Many different types of blocks & of a quantity so multiple toddlers can build A good set of wood unit blocks including arches, pillars, ramps, & curves (essential) Large hollow blocks Small color cubes Large interlocking blocks (Mega Bloks® or Duplos®, bristle blocks) Interesting blocks to inspire imagination (window blocks, magna-tiles, natural tree blocks) Materials to support dramatic/creative play (toy people, animals, vehicles, trees, wooden trains & tracks) Materials to encourage pretend play (small pieces of fabric, colored paper, foil) Fiction & non-fiction books about building

## LINKS TO DIRECTIONS FOR DIY BLOCKS

**Cardboard Building Blocks** [b-inspiredmama.com/recycled-diy-toys](http://b-inspiredmama.com/recycled-diy-toys)

**Milk Carton Blocks** [blogshewrote.org/milk-carton-blocks](http://blogshewrote.org/milk-carton-blocks)

**Home-Made Wooden Blocks** [thecreatedhome.com/diy-wooden-blocks-kids](http://thecreatedhome.com/diy-wooden-blocks-kids)

**Jumbo Building Blocks** [thestay-at-home-momsurvivalguide.com/diy-jumbo-building-blocks](http://thestay-at-home-momsurvivalguide.com/diy-jumbo-building-blocks)

**Wooden Tree Blocks** [adventure-in-a-box.com/how-to-make-waldorf-inspired-nature-blocks-creative-challenge](http://adventure-in-a-box.com/how-to-make-waldorf-inspired-nature-blocks-creative-challenge)

**Fabric Blocks for Baby** [andnextcomesl.com/2014/07/homemade-personalized-fabric-blocks-for.html](http://andnextcomesl.com/2014/07/homemade-personalized-fabric-blocks-for.html)

## RECOMMENDED RESOURCES/READING

Gura, P., & Bruce, T. (1992). *Exploring learning: Young children and blockplay*. London, UK: Paul Chapman.

Hendrick, J., & Weissman, P. (2006). *The whole child: Developmental education for the early years and early childhood settings and approaches*. Columbus, OH: Merrill.

Kamii, C., & DeVries, R. (1978/1993). *Physical knowledge in Preschool Education: Implications of Piaget's theory*. New York, NY: Teacher's College Press.

Kamii, C., Miyakawa, Y., & Kato, Y. (2004). The development of logico-mathematical knowledge in the block-building activity at ages 1-4. *Journal of Research in Childhood Education*, 19, 44-57.

Lewin-Benham, A. (2010). *Infants and toddlers at work: Using Reggio-inspired materials to support brain development*. New York, NY: Teachers College Press.

Provenzo, E., & Brett, A. (1983). *The complete block book*. Syracuse, NY: Syracuse University Press.

Sarama, J., & Clements, D. (2009). Building blocks and cognitive building blocks: Playing to know the world mathematically. *American Journal of Play*, 1, 313-337.

Stiles-Davis, J. (1988). Developmental change in young children's spatial grouping ability. *Developmental Psychology*, 24, 522-531.

Wellhausen, K., & Kieff, J. (2001). *A constructivist approach to block play in early childhood*. Albany, NY: Delmar.