**Arkansas Children's Week**

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# Zoning In on Construction

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# Zoning In On Construction

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## *Think of the space that you share with children…*

*What if there was something you could add to this space that would encourage the children to think symbolically, helping them grow into strong, eager readers in years to come?*

*What if there was something you could add to this place that would improve children's math performance, not just in the early years, but in high school and college, as well?*

*What if there was an activity that you could share with children today that would help them develop crucial thinking skills - logical reasoning and problem solving?*

*What if there was something that you could add to this space to encourage children to build social skills - negotiation, cooperation, and collaboration?*

*And, finally, what if there was something you could add to this place to naturally help children develop strong work habits, like planning, persistence, and concentration?*

As early childhood educators, we're dedicated to providing the best possible start in life for the children in our care. It's important to us that their time with us is both enjoyable and purposeful. Would you believe that there is one simple ingredient that can be added to the early childhood environment to provide all five of the amazing outcomes listed above?

The ingredient: a set of blocks.

Block play is proven to benefit children in all of these ways, and more! Children who have plenty of time, space and materials to build with blocks every day learn and grow in incredible ways – physically, socially, and cognitively. Considering the many benefits that block play provides for children, a set of blocks can be described as one of the most valuable materials in the early childhood environment.

As we celebrate Arkansas Children's Week, we'll focus on ways to enhance our block building areas and optimize children's experiences as they work with blocks. We'll also consider other opportunities for constructive play, indoors and out, throughout the day. In the pages of this book and in our Children's Week workshop, you'll find actual photos of children's constructive work, generously shared by real programs throughout Arkansas.

**Join us for celebrating Arkansas Children's Week 2015!**

# We're zoning in on construction!

# 7 Big Benefits for Young Builders

1. Block play strengthens a child's **mathematical thinking skills**, **social skills**, **abstract thinking skills**, **creativity**, and **literacy-readiness** (Hanline, Milton, & Phelps, 2009). What other material can do all of that at once!?!

2. Although there are many books, computer programs, and aps designed to teach math to young children, the real secret to math success is *logico-mathematical knowledge* (Kamii et al., 2004). Learning to think in this unique way builds the foundation children need to truly understand counting, sorting, and classifying, and they can **only develop it when they have a chance to interact with real objects, like blocks**!

3. **Math benefits from block play extend beyond kindergarten and first grade.** In fact, preschoolers who were given the time, space, materials, and encouragement for complex play with blocks during the preschool years had higher mathematics test scores in seventh grade. These advantages continued in high school, where they had better math grades and were more likely to be enrolled in honors math courses (Wolfgang et al., 2001).

4. Not only that, but for girls, equal access to blocks and other building materials during the early childhood years was proven to **eliminate the boy-girl gender gap** in high school mathematics performance (Wolfgang et al., 2001).

5. When children who were given ample opportunities to play with divergent (open-ended) materials – like blocks – were compared with children who were exposed to mostly convergent materials – like puzzles, matching activities, and lacing cards – the block builders performed better on problem solving tasks (Pepler & Ross, 1981) . They demonstrated **lower levels of frustration** and **higher levels of creativity** when solving problems.

6. "Block play provides a structure and foundation for children to learn to persevere, develop self-control and delay gratification, expand curiosity, gain self-confidence, and learn to overcome failure." (Tough, 2012) Perhaps most amazingly, **children are *naturally motivated* to build these perseverance skills** when they work with blocks; no nagging required!

7. Even adolescents benefit from block play! A study shows that young teens who have opportunities to engage in cooperative construction projects with peers form **higher-quality friendships** (Roseth et al., 2009).

## It's a fact – every child needs blocks!

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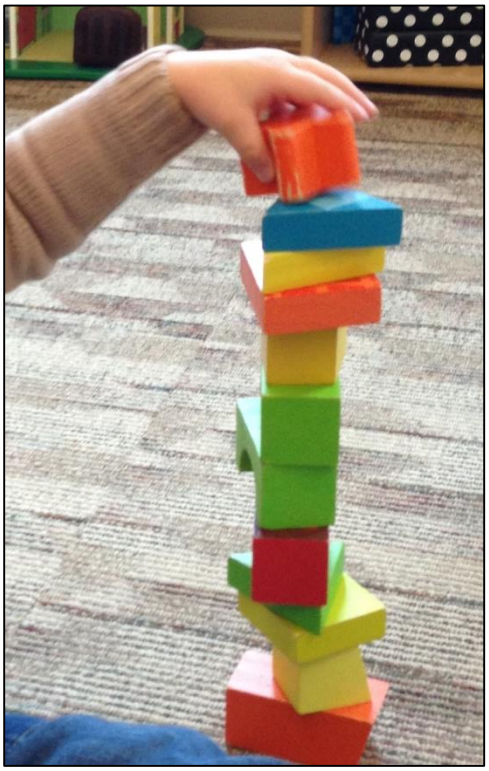


***A toddler stacks blocks***
*Photo shared by The New School*

***Schoolagers' wooden blocks***
*Photo shared by*
*The Children's Center of Otter Creek*

# Stages of Construction Play

Just as the young artist naturally progresses from first scribbles to simple line drawings, before finally making complex sketches, the young builder naturally moves through identifiable stages of development. Every milestone in her journey represents gains in coordination, creative thinking, and cognitive skills. Each stage is important, and each new skill strengthens a foundation to support the development of more complex skills yet to come.

## Exploring pieces.

*Omar stretches to grasp a round, cylinder block and bring it to his mouth.*

*Jonah dumps out containers of objects and carries the pieces around the room.*

*Ella sits on the floor with a single, large block in one hand. She scoots the block back and forth across the floor in front of her in a wide, arcing motion.*

At this stage of construction, the child explores the characteristics of pieces by touching and moving them but does not yet attempt to build. This stage is typical for infants and younger toddlers, or for older children who have never experienced block play. Some children who are unfamiliar with blocks prefer to hang back and watch other children play before approaching the materials and play space.

**What they're learning as they explore pieces:**

- How blocks feel, sound, and even taste – sensory exploration.
- A beginning knowledge of concepts such as empty/full and heavy/light.
- Mastery of physical skills, such as lifting a bin full of blocks and tipping it to allow the blocks to spill out.

*What's this? Very young children explore building materials by touching, tasting, carrying, and piling them.*

## Working on a flat surface.

*Max pats out clay flat on a tray.*

*Sharelle makes rows of blocks in a long line on the floor.*

Now, the child works on one level, usually on the floor or table surface. She isn't building "up and out" yet, but she's beginning to explore ways that she can group materials in simple collections and rows.

This is typically a toddler/rookie builder stage. Older, more experienced builders may also line up blocks in a single row to represent roads or other structures, but this is done in conjunction with vertical building.

***A toddler lines up unit blocks on the floor***
*Photo shared by Kiddie Kollege*

**What they're learning as they work on a flat surface:**

- Understanding of how blocks/materials are alike/different.
- Coordination to place blocks purposefully.
- Concentration - focus on a task for a period of time.

## Building up.

*Samuel sticks Duplo bricks together – one on top of the other - to make a tower.*

*Sarah Lynn pinches off balls of play-dough and stacks them together.*

As she begins to build upwards, the child stacks materials in simple ways. She may work carefully to line up blocks "just so". This building stage is often seen in the toddler room, with younger preschoolers, and with older rookie builders. Children's play during this stage is naturally repetitive. They'll construct similar structures over and over, day after day. As the child grows more experienced, stacks may be combined with rows (above) to fill the available floor space.

***A young preschooler carefully stacks homemade tree branch blocks***
*Photo shared by Shining Stars*

**What they're learning as they begin to stack blocks vertically:**

- Math concepts related to size, shape, height, and weight.
- Visual discrimination and motor planning to adjust reach high/low and near/far.
- Early understanding of balance and gravity, paired with explorations of cause and effect.

## Bridging.

*Marcus places two cardboard bricks beside one another and then places a third brick across the top, creating a bridge.*

The child places blocks horizontally to span the space between other supporting pieces. He's figured out how to move beyond simple stacks, and blocks are placed very carefully, with purpose. For the first time, his construction includes an open interior space. Bridged construction will grow increasingly complex when the child has plenty of time and space to explore. With children who have ample exposure to blocks, bridging often begins in the third year.

**What they're learning as they bridge with blocks:**

- Scientific design concepts related to stability and balance.
- Planning skills – thinking things through.
- Math concepts related to height and width – selecting blocks of the right size to fit together.
- Persistence of task. Success with bridging often requires trial and error.

## Building enclosures.

*Nadia and Imani use plastic cubes to make a series of "cages" for small, toy zoo animals.*

*Mason and Will use the big, hollow blocks to enclose a large rectangle around the rug in the block center. They hop inside and lie on the floor, giggling. "We're in our bed!" they tell you.*

The child uses materials to close up spaces in a way that has width and depth. Block play often includes two or more children working together and now, more than ever before, block play begins to be closely linked to imaginative pretend play.

To the casual observer, this may look like less complex play than the prolific block towers and rows that came before. Actually, the child has begun to think symbolically and is working with great purpose. This stage of block building typically occurs when children are three, four, and five years old.

**What they're learning as they build enclosures:**

- Understanding of concepts of *open/closed* and *inside/outside*.
- Early indicators of symbolic thinking as the child names the structure and/or function. ("It's a fence" or "This is the house.")
- Often, social skills. Children communicate and compromise to work together.

***"A Fence for the Animals"***
*Preschoolers construct an enclosure with long wooden unit blocks*
*Photo shared by CAPCA Head Start, Mills Center*

## Constructing in complex ways.

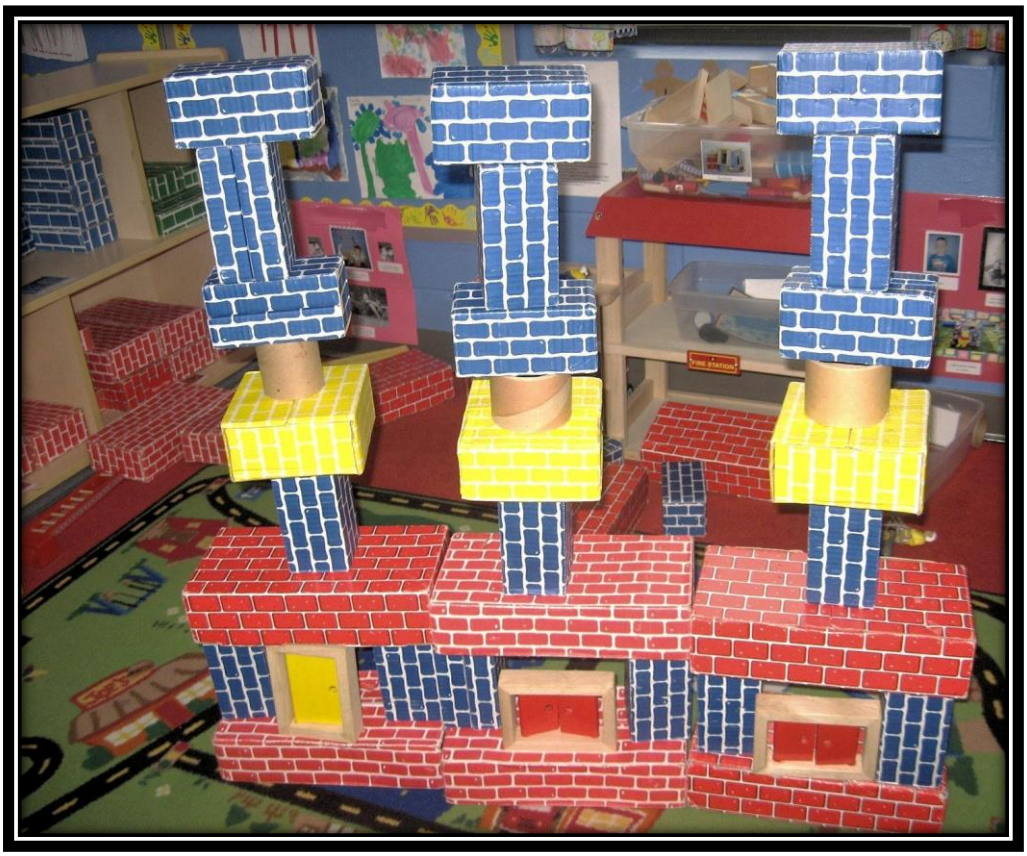
*Abigail, Ty, and David work intently to use all of the wooden unit blocks to create a building that is tall and wide. They carefully place accessories – plastic zoo animals and small toy boats – on and around their structure.*

Now, children use materials with a growing sense of pattern, symmetry, balance, and design. Many pieces are incorporated into elaborate structures, combining the elements from their earlier block building experiences. Rows, towers, bridges, and enclosures may all come together in one large "superstructure". Complex construction often begins in the fourth and fifth year.

Building is now a highly social activity, with children working together to create large structures. This collaborative play is usually harmonious, but disagreements are not uncommon as leadership roles emerge.

**What they're learning as they construct in complex ways:**

- Design concepts related to patterns and symmetry.
- Logical thinking skills – creating a design that works, and modifying as needed.
- Attention to a complex task; builders may work intently for 20 – 30 minutes or longer.
- Social navigation. Children learn to share ideas and negotiate. Leaders are established.



***"A Look-through Castle"***
*Preschoolers combined cardboard brick blocks, wooden door and window pieces, and recycled tape tubes in an elaborate structure*
*Photo shared by Northside Elementary Koala Preschool*

## Pairing complex structures with elaborate dramatic play.

*Isabell uses masking tape to join cereal boxes, cardboard tubes, and other "recyclables" to make a pretend robot. She names her robot and uses stickers to make a control panel on the back. She takes the finished robot to join in pretend play with friends.*

*Norah and Jaylen use wooden cubes and planks to build a multi-story parking garage, complete with a gate and an elevator. They play on the floor around the structure, pretending to be drivers arriving and attendants parking cars.*

In this advanced stage of building, children create structures that realistically represent places and things. The child's knowledge of her world is reflected in the features of the construction. For example, a hotel construction may include a lobby, swimming pool, and long rows of guest rooms, while a barn construction may include stalls and a hayloft.

Once the structure is complete, advanced builders are less likely want to immediately demolish it and begin again, as younger builders often do. Pretend play often continues around the completed structure, and the children may wish to leave the structure in place for extended periods of time over the course of hours or even days. Advanced construction with dramatic play often emerges in the fourth, fifth, or sixth year and continues to hold great appeal at ages seven and eight.

**What they're learning as they pair complex structures with dramatic play:**

- Intensive planning and problem solving.
- Advanced communication skills as they describe, explain, and take on pretend play roles.
- Complex symbolic thinking.


*"**Drive-through Car Wash**"*
*Kindergarteners use several sets of blocks and incorporate paper signs into their design After the hard work of building is done, they'll stay and play: paying for carwashes and driving small vehicles through the structure.*
*Photo shared by Harris Family Home*

# Dump, Fill, Scatter, Gather
## Young Toddlers and Toys

*14-month-old Amber seems to study the shelf of toys carefully before reaching for the large bin of blocks. She strains to lift the bulky bin from the shelf and totters precariously. Then, with a look of intense concentration, she upends the bin, letting dozens of colorful blocks rain to the floor in a noisy clatter. Amber gives a triumphant, delighted shriek and begins to kick and scoot the blocks on the floor.*
*Soon, other toddlers are joining in the fun.*

*"Oh, Amber!" her teacher sighs. "You've dumped the blocks out again? What a mess!"*

Beginning around their first birthday, many young toddlers show a keen interest in dumping out containers of toys. Their fascination with this sort of play can continue for months. In the busy toddler classroom, it takes mere minutes before many baskets of toys are emptied on the floor!
For the caregivers who work to keep a tidy classroom, with materials sorted and organized, it can feel like an endless and tiresome cycle of *picking up*.

It is valuable, then, for caregivers and parents to understand that toddlers who dump out toys aren't doing it to be naughty. In fact, this is an important stage in their development. Just as the child who is learning to talk babbles and plays with new vocal sounds, the growing toddler will playfully explore how she can control materials in new ways. As a baby, Amber was content to bat at toys, grasp them, shake them, and bring them to her mouth. Now, she is learning that she can do so much more!

**Developing a sense of control**

As Amber watches the blocks tumble to the floor, she might be thinking, "***I** did that*!" Toddlers are learning to be independent and discovering the exciting ways that they can purposefully interact with their world.

## Planning and using large muscles

Amber worked hard to lift the bulky block bin, and harder still to tip it over. It took strength, balance, and coordination that she didn't have just a few months ago, and it feels powerful to her to accomplish her goal!

## Exploring new ways to use hands and feet to interact with objects

The simple grasping and banging play of infanthood has given way to new ways to play as Amber gathers, scoots and slides the blocks.

She's building hand-eye coordination and thinking creatively as she discovers ways that objects can be used together.

## Experimenting with cause and effect

Amber wonders, "*If I do the same thing again, will I have the same result*?"

She'll repeat her actions over and over, time and time again, to investigate how things act and react.

**Trying out new roles**

Amber and the other young toddlers are naturally *parallel players.* That means that they may enjoy playing alongside one another, but they aren't quite ready to play together purposefully yet. That doesn't mean that they aren't aware of one another's actions. In fact, toddler teachers will tell you that it is quite common for one toddler to imitate the actions of another – moments, hours, or even days later. Amber's teacher can expect to see other toddlers trying out her toy tipping game soon!

# The adult's role in toddler play

It's important for the adults who care for young toddlers to be patient with the seemingly endless dumping of toys. Through this sort of play, toddlers are building their bodies, brains, and sense of self. Just as crawling precedes walking, exploring toys in this way almost always comes before more advanced play, such as stacking and lining up blocks. If an adult scolds the toddler for dumping out toys, or removes toys with loose, dump-able pieces from the classroom, children's development can actually be delayed.

In addition to being patient with busy toddlers, here are some other ways that adults can facilitate children's play:

- Offer a variety of containers to fill and empty, such as bowls, baskets, boxes, and bags.

- Continue to sort and organize toys. Why sort the toys if the toddler is just going to dump them out again? Organization is valuable because we want each child to experience orderly materials and have all of the pieces he/she needs for more structured play when the time comes.

- Don't insist on one "right" way to use materials. Although unsafe or destructive use of materials should be redirected, any play that is safe and appropriate should be allowed. For example, instead of filling a toy purse with toys, a creative toddler might put the purse on her head to wear as a hat.

- Follow the child's lead during repetitive play. Toddlers learn by repeating the same actions over and over again. Play along as a toddler fills and empties a pail again and again, or builds a tower to knock down time after time. When possible, use words to describe the toddler's actions as she plays.

- Offer a wide range of materials to encourage cause-and-effect exploration and discovery, such as:
    - Nesting cups, shape sorters, and stacking rings
    - Ramp toys for large balls or cars
    - Shallow containers of water to scoop and pour, with very close supervision

# Simple, homemade toys for toddler exploration

***Baby wipe box with plastic and metal jar lids***

***Curlers with plastic jar to fill and empty***

***Wooden mug tree with bangle bracelets and napkin rings***

# 8 Tips for Creating a Special Space for Block Play

A well-designed block center helps children engage in focused, successful play.
Here are eight tips for arranging an optimal space for building:

1. **Provide a suitable surface for building.** A low-pile rug on a level, hard floor offers a stable building surface, helps reduce noise, and provides a comfortable place for builders.

2. **Think big!** The block area is one of the busiest places in the classroom, and a spacious area helps children work and play together in positive ways. Provide as much space as possible for builders to interact without crowding. The space should also suit the size of the blocks and accessories. If you add very large blocks or oversized trucks to your block area, children will need even more room to build.

3. **Create a place especially for blocks and builders.** Design a space where builders won't have to compete for floor space with other kinds of play. Avoid filling this space with other kinds of materials – like floor puzzles or musical instruments – that have nothing to do with building. If your block area is very large, you may be able to include toys that can be used alongside blocks, such as a toy barn or wooden train tracks. However, if your space is limited, move these items to their own corner of the classroom to avoid interfering with construction play.

4. **Keep an eye on traffic patterns**. Select a low-traffic area of the classroom for block play to allow builders to concentrate with few disruptions. Use furnishings, rugs, and other visual clues to direct children around – not through – the block area as they travel across the classroom.

5. **Match materials to the ages and abilities of the builders**. Select chunky, easy-to-grasp materials for toddlers and very young preschoolers. Provide more complex materials for older children. Children can become bored with materials that are too simple, or frustrated with materials that are too challenging. Observe your children to find materials that are just right!

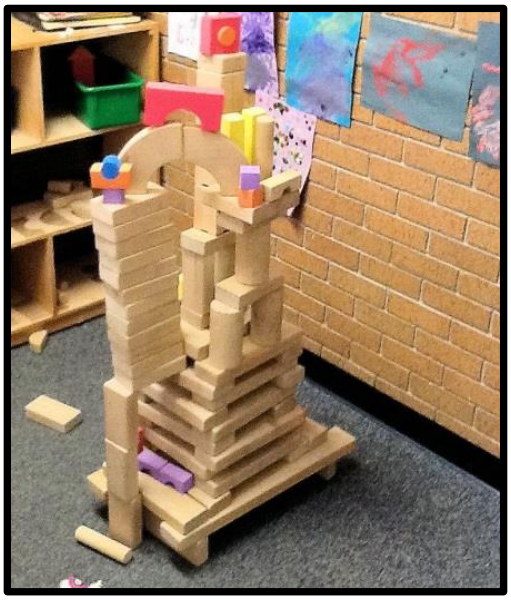
6. **Organize your area**. Group blocks and props by type on low, open shelves. This makes it easy for children to find and reach the materials they want. Picture and word clues on containers and shelves help children return materials to the proper places when they're finished.

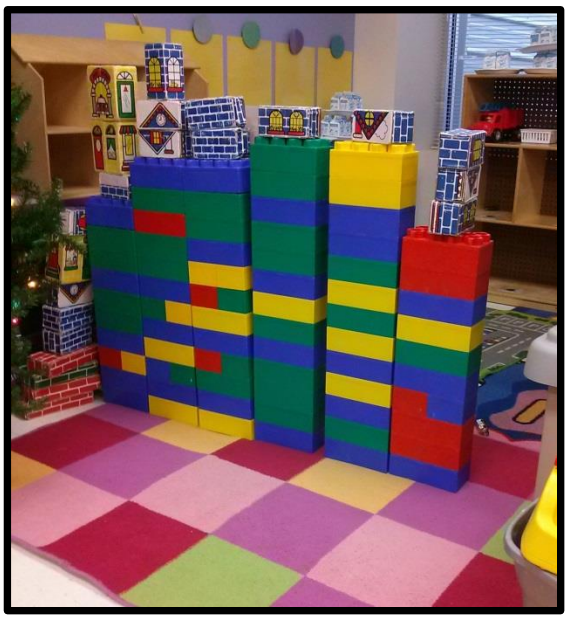
7. **Model and guide**. Some children have never experienced blocks before and don't yet know how to use these materials. Play alongside children and invite reluctant builders to join you. When behavioral challenges occur, redirect the behavior to help children use the blocks in more appropriate ways.

8. **Offer block play every day**. Building with blocks is one of the most valuable and vital learning activities that we can offer children. It can be noisy and messy, but it's worth it. Ensure that children have lots of time to use your block area every day. Math, science, reasoning, and social skills will soar because of the time they spend in your special space for block play!

# Special Spaces for Builders

Each of these block building areas offers a **dedicated space just for construction**, with **ample floor space**, **organized storage**, and a **level surface for building**.





*Photos shared by (clockwise, from top left) Building Bridges; Northside Koala Preschool; CAPCA Head Start, Beebe Center; and Rogers Pre-K*

# Many Ways to Engage in Construction Play

The experience-rich early childhood environment offers many different opportunities for children to build and explore.

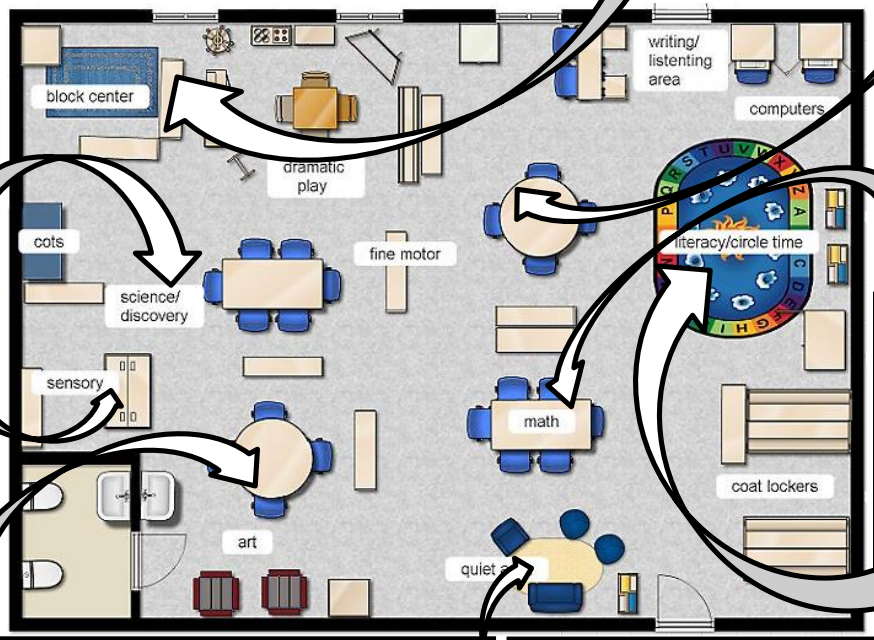
Constructive play blossoms in the **block area**! Here, children explore:

- Wooden unit blocks
- Hollow blocks
- Homemade blocks
- Specialty blocks, such as tree blocks
- Accessories and loose parts to enhance block building

Interlocking block sets in the **fine motor area** are perfect for constructive play.

**Science** and construction can go hand-in-hand. Try adding:

- Magnetic tile blocks
- Light table with transparent, interlocking blocks
- Experiments with ramps




How long? How tall? Add materials that can be stacked and measured to the **math area**, and/or add measuring tools throughout the classroom.

Construction in the **sand and water area**? Yes, please! Try:

- Molds with damp sand
- Rocks and planks in sand
- Toy construction vehicles
- Chutes and tubing for water

During play times, repurpose the spacious **circle time rug** for play with:

- Wooden train tracks
- Interlocking log construction sets
- Marble runs

The **art area** is a perfect place for building "up and out" with 3-dimensional materials:

- Clays and doughs
- "Recyclables" with tape
- Wood pieces with glue

In this cozy **library**, children relax with great picture books that may inspire constructive play later. Top picks include:

- *Alphabet City*, by Stephen T. Johnson
- *Changes, Changes*, by Pat Hutchins
- *Dreaming Up: A Celebration of Building*, by Christy Hale

*Classroom map designed with Kaplan's free floorplanner program: https://www.kaplanco.com/resources/floorplanner.asp*

# Building on a Budget
## Homemade Blocks & Construction Materials

## Paper Sack Bricks
All ages

You'll need:

- Paper grocery sacks
- Old newspapers, gift wrap or other recyclable paper
- Sturdy tape

1. Gather sacks. You'll need two, same-sized sacks for each brick.
   Most grocery stores will be happy to donate, or you can ask families to save their sacks after trips to the store. Smaller paper lunch bags can also be used, but will be less sturdy.

2. Stuff a sack with crumpled paper from newspapers or old catalogs. Gift wrap from opened presents can also be repurposed in this way. Children will enjoy helping crumple the paper.


3. When the first bag is fully stuffed, place a second, empty bag upside-down over the top. The top of this second bag will line up with the bottom of the stuffed bag. Tape the bags together to seal. Alternatively, you may cut and fold the top of a single bag to close squarely.

4. Blocks may be covered with contact paper, shelf paper, paper, or colorful duct tape, if desired. Or, invite children to decorate the blocks with markers and/or paint.

# Tree Branch Blocks

Blocks with bark for ages 3 & up
Smooth sanded, bark-less blocks are suited for all ages

You'll need:

- Small and medium tree branches
- A sturdy saw
- A sawhorse or other safe way to cut wood
- Beeswax sealant (optional)

1. Begin by selecting fresh felled tree branches. Gather these when they fall after storms or when pruning trees. Avoid older, rotted branches that have been on the ground for any period of time, as these may contain mold and insects.

2. Place wood in a sheltered place, such as a shed or garage, to dry. Wood that is allowed to dry fully (also known as seasoned wood) will make very sturdy blocks that last for many years. However, this process can take 6-12 months. Wood that is not seasoned can be played with right away, but may be softer and less sturdy in the long run.

3. Once you're ready to begin making blocks, saw the branches into sections using a handsaw, pruning saw, or chainsaw. If power tools are used, this step should not be completed while young children are present. Your goal is to make blocks with flat, level tops and bottoms. This will allow the blocks to stack effectively as children play with them.

4. Smooth any rough edges using sandpaper. If desired, the blocks can be sealed with a beeswax wood sealant or other child-safe product.

# Ramps for Rolling

Ages 3 ½ - 12

You'll need:

- 1 ½ - 2 inch cove molding
- A saw (see note, below)
- Sandpaper
- Props to elevate your ramps, such as blocks, coffee cans, child-sized chairs, or stacked books
- Balls for rolling – marbles, rubber balls, ping pong balls, and/or golf balls
- Clean, empty margarine tubs or other containers for storing and catching marbles/balls

1. Select a simple cove molding with a flat back and a slightly rounded top.

2. Cut the molding to the desired lengths. Two, three, and four-foot lengths are perfect for beginning builders. Schoolagers may be able to handle longer pieces.
   *Note: Most home improvement stores will cut cove molding for you for free.*

3. Sand any rough edges.

4. Introduce ramps to children in a large or small group gathering. Model safe use of the materials; it is important for children to use care when carrying and moving the wooden pieces in the busy work area.

5. As children work and play with the materials, notice how they use the molding pieces as flat, floor-level roads, as elevated bridges, and as angled ramps. Encourage them to experiment and make observations. With plenty of time to explore, their work will grow more complex as they modify their designs to solve problems.

***Safety note**: Small balls like marbles should not be used with children under 3 years of age. If you have children of any age who are prone to placing small objects in their mouths, very close supervision is needed. Offer larger balls, such as golf balls, at times when an adult cannot provide direct supervision.*

# Newspaper Rods for 3-Dimensional Construction

Ages 3 ½ - 12

You'll need:

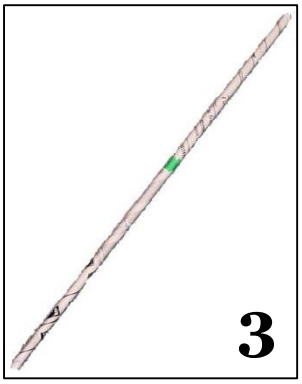
- Old newspapers
- Masking tape or chenille stems
- Materials for decorating, such as paints, crepe paper streamers and stickers (optional).

1. Open a single sheet of newspaper and lay it flat on the table or floor.

2. Tightly roll the newspaper diagonally from corner to corner to form a sturdy tube.

3. Secure the edge of the rolled paper tube with a small piece of masking tape or a twisted chenille stem.






4. Repeat this process until you have a collection of rods.
   *Hint: a clean, empty trash can makes a perfect storage bin to keep ready-to-use rods tidy and neat.*

***Rods can be joined with tape or chenille stems (pipe cleaners) to make domes and structures, such as the one at right.***

# More “Collectables” for Construction Fun

- Canisters from oatmeal, coffee, Pringles chips
- Cardboard packing tubes – cut into shorter columns or leave long for use as tunnels
- Cereal boxes and Pop-tart boxes, stuffed with newspaper and taped closed
- Empty cardboard cans from frozen fruit juice concentrate
- Foam pipe insulator – cut in half lengthwise – for marbles and balls
- Lidded plastic tubs from margarine, whipped cream cheese, etc.
- Plastic drinking cups and/or yogurt cups to stack
- Pool noodles sliced into stackable rounds
- Round, plastic lids from laundry detergent bottles
- Shoeboxes

***“Pirate Look-Out” with cardboard tube***
*Photo shared by*
*WCC Bear Cub Pre-K*

***Cup Stack***
*Photo shared by*
*Tennie Russell Primary School*

***Pipe insulator ramps with popsicle stick path***
*Photo shared by Shining Stars*

# 3 “P’s” for Purposeful Construction in the Block Area

Offer children everything that they need to design and build complex, creative structures!

## Pieces

***Pieces*** are the actual blocks that children will use to stack and build.
Provide at least 2-3 sets of blocks, such as:

Cardboard bricks

Hollow wooden blocks

Homemade blocks

Large cube blocks

Tree branch blocks

Unit blocks

Wooden plank blocks, such as Kapla tiles

When deciding how many pieces your children need, reflect on the ages and abilities of your group. How many children will play in the block area at once? You’ll want to provide enough pieces for each child to enjoy building large structures without undue competition for materials. Too few pieces can result in arguing and upset, while ample pieces will promote cooperative play.

***A group of 5 – 8 year olds combined many different pieces in this creative project***
*Photo shared by The Children’s Center of Otter Creek*

# Props

***Props*** are accessories that complement block play. For example, children might use wooden blocks to build a barn and then fill it with toy farm animals.

Other props include, but are not limited to:

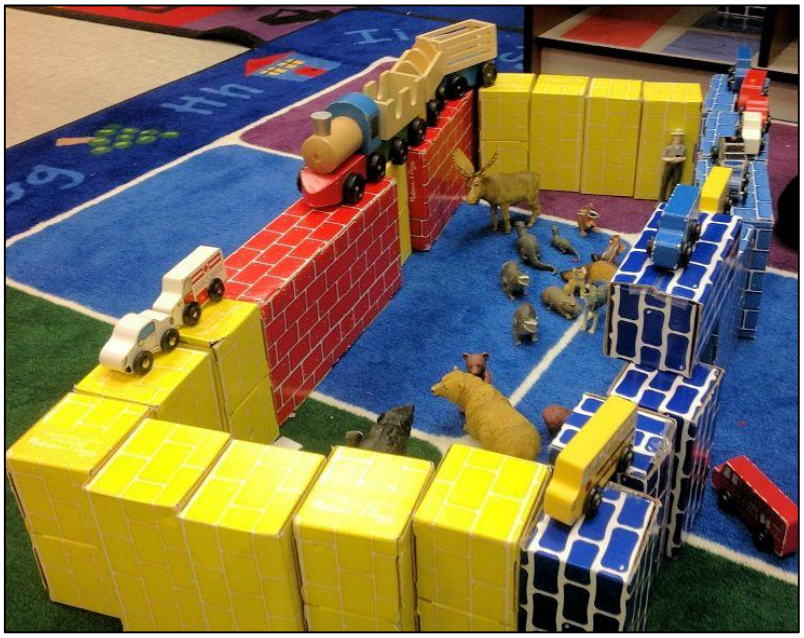
| | |
|---|---|
| Chess figures | Road signs |
| Construction vehicles | Seashells |
| Dinosaurs | Small toy cars |
| Dollhouse figures/toy people | Tractors and farm props |
| Dollhouse furniture | Trains |
| Insects | Zoo animals |

Provide at least 2-3 sets of props to provide several options for play. Rather than leaving the same props on the shelf all year long, consider rotating to reflect seasons, themes, and children's interests. For example:

**Back-to-school props** – school busses, cars, figures of children, dollhouse furniture

**Autumn props** – tractors, farm animals, small pumpkins, woodland animals, colorful silk leaves, pinecones, small flashlights

**Props for children interested in fairy tales** – plastic gems and coins, castle character figures, plastic horses, laminated photos of real castles



***"A zoo with a train to carry the animals"***
*Here, props enhance a preschooler's imaginative block play.*
*Photo shared by Westside ABC Preschool*

# Parts

***Parts*** are open-ended materials that can be used to enhance designs or used symbolically for pretend play. Unlike props, which have a pre-determined function, loose parts can be anything the child fancies. A toy fire truck will always be a fire truck, but a wooden spool can be a barrel, wheels for a car, or a character in a story – it's all up to the child's imagination!

Here are some loose parts that complement block play:

| | |
|---|---|
| Bangle bracelets | Napkin rings |
| BINGO chips | Old CDs |
| Cardboard tubes | Plastic curlers |
| Felted wool balls | River rocks |
| Metal jar lids | Silk scarves |
| Milk jug caps | Wooden spools |

To encourage creative, open-ended play, offer at least 2-3 sets of loose parts, providing a variety of materials and textures.

***Wooden plank building***
*Loose parts – including round river rocks and silk flowers – enhance this structure.*
*Photos shared by Gunderman Family Home*

# Something New to Do:
## Fresh Ideas for Block Play

**I wonder what would happen if…**

*…we put unbreakable mirrors in our block center?*

**I wonder what would happen if…**

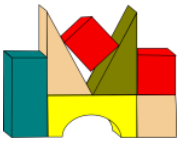
*…we put a light in the block center to explore shadow play on the wall?*

**I wonder what would happen if…**

*…we mounted a small, durable video camera to record children's work and interactions in the block area?*

**I wonder what would happen if…**

*…we added lightweight foam blocks to our water table?*



**I wonder what would happen if…**

*…we swapped our old, familiar block accessories with something unexpected and new, like silk flowers, pirate's treasure, or chess pieces?*

# Talking with Builders

Did you know that the number of different, meaningful words that a child hears during early childhood is one of the strongest predictors of how rich her vocabulary will be when she is grown? It's even okay to use words that children haven't heard before and don't know yet. In fact, their brains are wired to decode and understand new words when the words are introduced in a context that corresponds to the child's actual activities and experiences. This is how a child's vocabulary grows!

As children work and play with construction materials, take time to observe and describe their actions. Well-timed comments and questions will help language skills blossom.

## Upgrade your teacher talk

When talking with toddlers:
Instead of "You're playing", try "**You're stacking the wooden blocks**."

When talking with a younger preschooler:
Instead of "The blocks fell", try, "**Our tower toppled over!**"

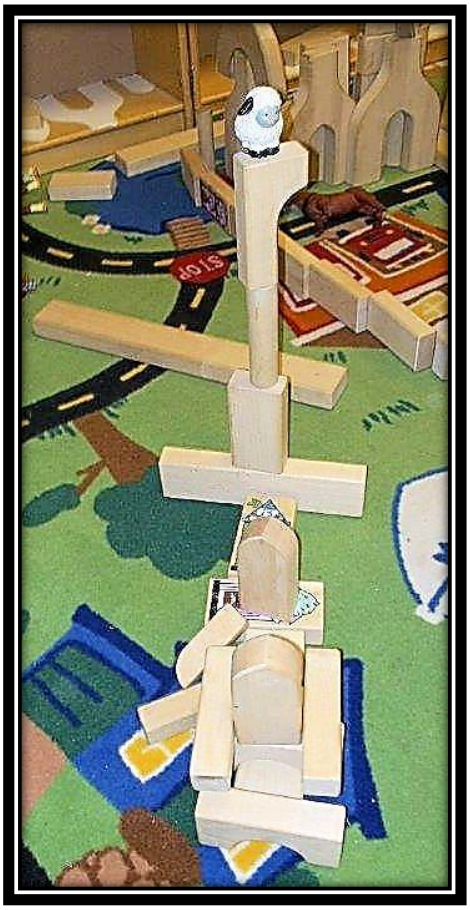
When talking with older preschoolers or schoolagers:
Instead of "You used a lot of blocks", try, "**I see that you've placed the column blocks along the top of your structure.**"

## Let's Talk…

| **…about the blocks** | **…about construction concepts** | **…about builders in action** |
|---|---|---|
| Arch | Curve<br>Foundation | Balance |
| Column | Inside/Outside | Bridge (span) |
| Corner | On top of | Concentrate |
| Cube | Path | Construct |
| Cylinder | Pattern | Cooperate |
| Edge | Peak | Demolish |
| Heavy | Ramp | Design |
| Hollow | Stable | Enclose |
| Pillar | Structure | Modify |
| Plank | Support | Organize |
| Rectangle | Symmetrical | Pretend |
| Solid | Tower | Stack |
| Square | Under | Topple |
| Wooden | | Transport |

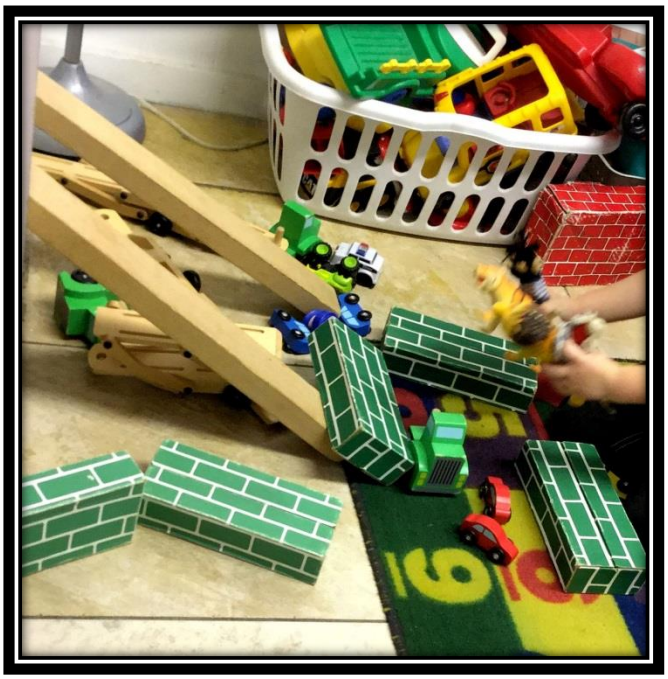
## How might you comment on each of these unit block structures?

Remember to use rich, descriptive words!



***Who is on top of that tower?***
*Preschool construction, at left, shared by CAPCA Head Start, Mills Center*

***Animals are headed up the ramps***
*Preschool construction, below, shared by Little Angels*



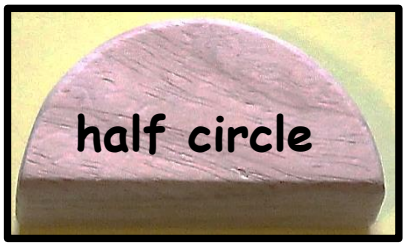
Did you know that each block in a set of unit blocks has a special name? Invented by educator Caroline Pratt in 1913, unit blocks are cut into precise, prescribed shapes and sizes. These are designed to naturally encourage children to discover and practice concepts related to geometry and "parts of the whole" - a foundation skill for understanding fractions later!

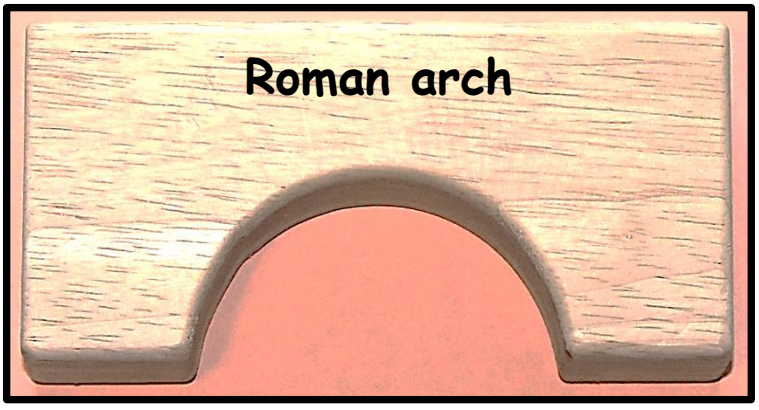
On the following pages, you'll find a glossary of the names of a dozen of the most common unit blocks. Consider displaying the glossary in your block area to help children and adults learn block names.

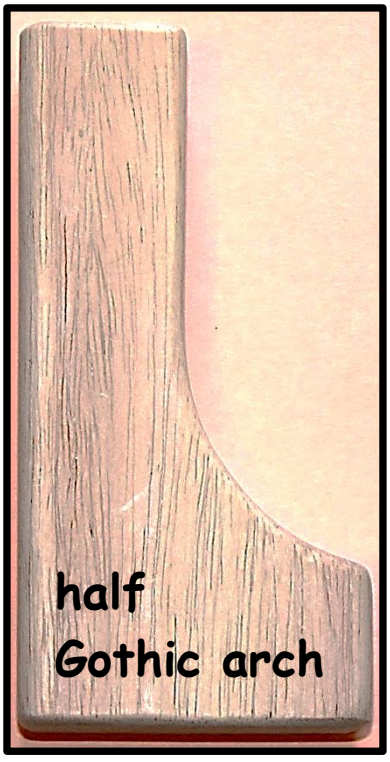
# Unit Block Glossary



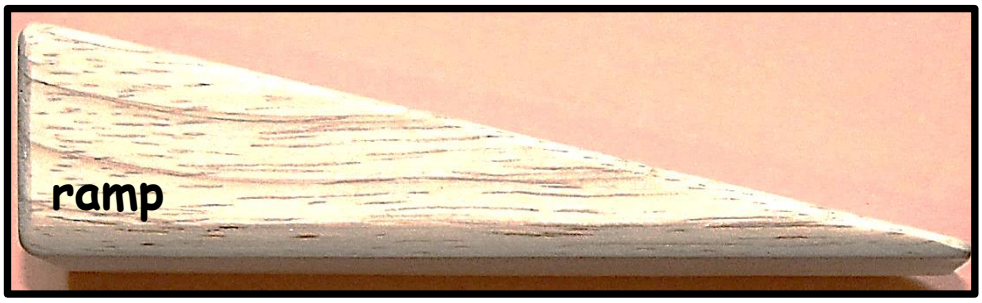


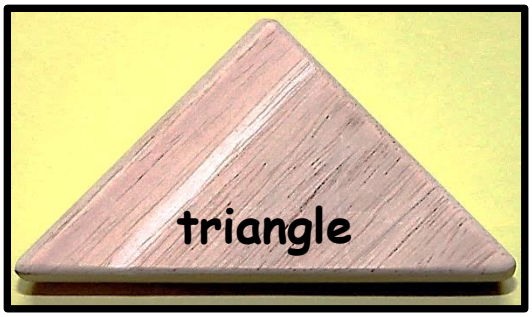


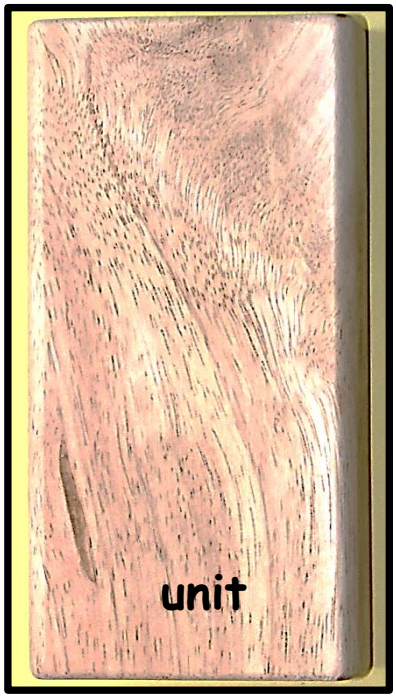



# Unit Block Glossary





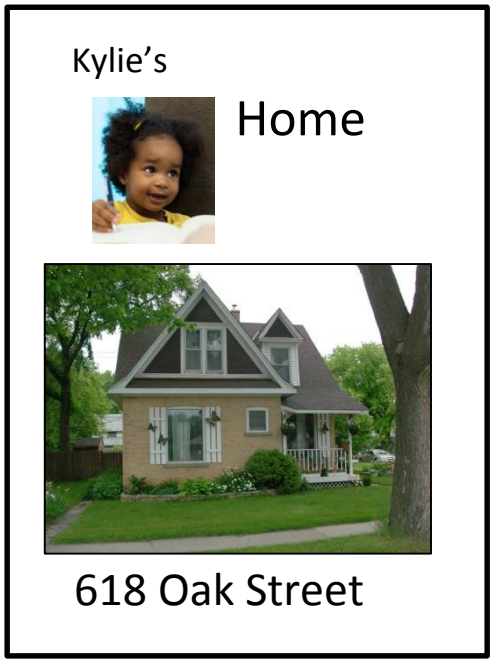



# Promoting Literacy in the Block Area

Literacy is much more than just recognizing the letters of the alphabet! Indeed, one of the greatest gifts that we can give our children is a natural motivation to *want* to read and write with purpose. This occurs when they come to understand that written language provides a powerful way to communicate information. In the block area, children are naturally inspired to draw plans, add signs to their construction work, and more. Here are some ways to incorporate literacy into block play.

**Give Me a Sign**
Take photos of environmental print that children see around their town, such as the signs on the front of familiar restaurants, grocery stores, gas stations, and more. Print the photos and attach to blocks with contact paper. Invite children to add these block signs to their construction work.

**Home Sweet Home**




Ask each family to submit a photo of the front of their home if they feel comfortable doing so. Create a simple book with a page dedicated to each child's home, including the photo, house number, and street name.

Children will enjoy paging through the book to find their own home and the homes of friends. Math skills also blossom as they notice shapes and count windows. Can they use the blocks to create a model of their home?

**An Architect's Board**
Mount a chalk board in the block area to encourage builders to draw and write about their block designs. This activity is best suited for older preschoolers who can more readily remember that the chalk is for the chalk board, rather than for drawing on the blocks and accessories. (Unless you don't mind chalk on the blocks, that is!)

**Map It Out**
Visit an Arkansas Welcome Center to collect maps of the state and your local region. Add the maps to your block center to spark conversations about travel as children spot familiar towns. Maps can be laminated, if desired. To find the Welcome Center nearest you, visit: http://www.arkansas.com/welcome-centers/

**Writers Welcome!**
Encourage children to make their own signs to label their block creations. Consider providing a basket of index cards, markers, and tape in the block center, or allow children to "travel" to the art or writing area to borrow materials when desired. They'll soon discover that signs are a great way to identify their structures and provide important information.


*This warning sign created by a kindergartener reads,* ***"Be Careful. Lion Might Bite."***

**Scrapbook It**
Use a camera to take photos of children's finished block work to add to an ongoing construction scrapbook. Invite children to tell about their creations as you write down their statements. This book can be used to recall favorite projects or to seek inspiration for new creations.


*"This is the guard with his sign.*
*It says, 'Don't come in without a ticket.'"*

- 4-year-old,
  Harris Family Home

# Promoting Math Skills in the Block Area

The block area welcomes children to explore many math concepts – including sizes, shapes, area, quantity, and more – in meaningful ways as they work with materials. As they freely stack and build, children develop and practice a wide range of important mathematical skills and strategies. Here are some ways to encourage even more math learning in the block area.

**Sort It Out**
Rather than offering a big bin of mixed-up blocks, sort blocks onto storage shelves by size, shape, and/or color. (Match the sorting system to children's ages and abilities.) Provide outlines or other visual clues to help children understand and use the system. As children select blocks from the shelves and clean up later, they'll naturally practice sorting and classifying.

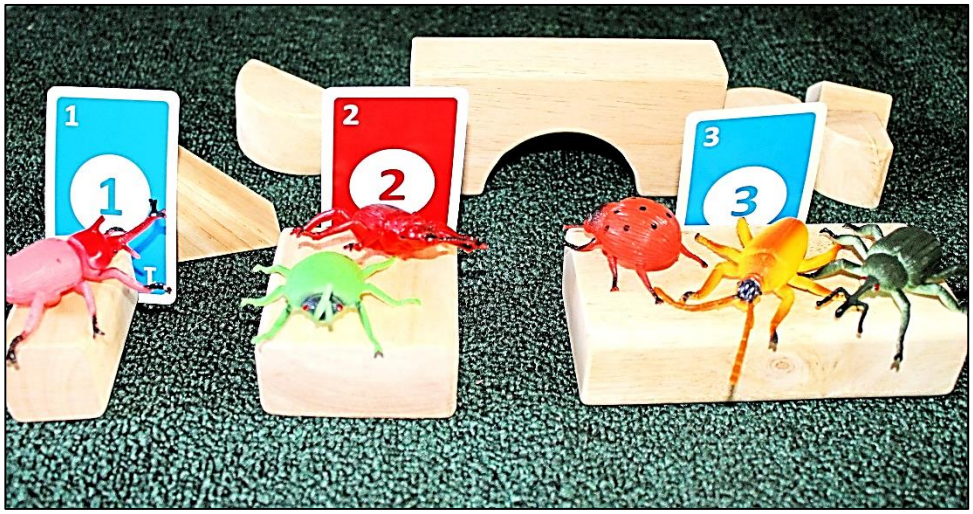
**Measure Up**
Include a collection of measuring tools in the block area. Possibilities include:

- Child-safe tape measure
- Yard sticks
- Rulers
- Level

Introduce the measuring materials by modeling how to use the tools purposefully and appropriately.
As you join in play with children, invite them to measure with prompts such as, "I wonder if we could figure out how tall our tower is."

**What a Card!**
Have you ever considered adding simple number cards as an accessory for block building? Cards may be handmade, or be pulled from commercial game decks such as games *Skip Bo*, *Uno,* or *Phase 10*. All of these feature large, clear numerals that are especially suited for preschool math learning.

Children may use the cards to represent house numbers, or they may begin to correlate the written numerals on the cards with quantities of block.




*Inspired by the book,* ***How Many Bugs in a Box*** *by David A. Carter, number cards have been paired with sets of toy insects in this block area.*

**Go Graduated**

Include a variety of graduated building materials. These are sets with pieces that are meant to be arranged from smallest to largest. Children compare sizes and quantities as they work with these materials.

Examples include, but are not limited to:

- Nesting cups and/or cubes
- "Tree Cookies" cut from branches of different, graduated diameters
- Tower and stair sets
- Cardboard tubes cut to different lengths
- Authentic unit blocks

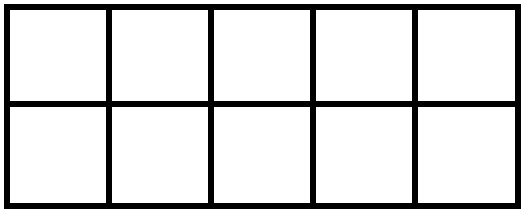
**Offer Inspiration**

Hang crisp, clear photos of famous structures in your block area, or gather them in a flipbook to store on the shelf. Seek out photos that will lead children to notice geometric shapes, symmetrical designs, and other mathematical concepts. Pyramids, arches, domes, and coliseums are all good picks.

*Photos such as these may naturally encourage children to explore shapes and lines.*

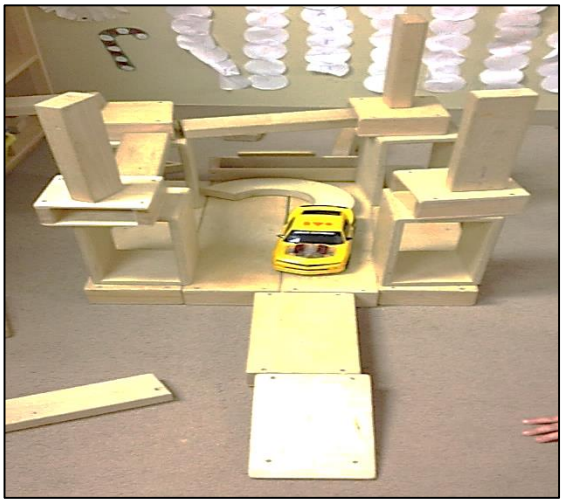
**Grid It**

Surprise your group by using masking tape to create a large, 10-square grid – such as the one pictured below – on the floor in the block area. Rather than directing children's work around the grid, let them experiment and find their own way to play. For example, one child might use the grid to sort different accessories, putting trucks in one "box" and animals in another. A second child might use the grid to inspire city construction, building a towering block skyscraper in each section. A third might make a pattern, filling the squares of the grid with different colors of blocks. Be sure to visit the block area as children play to talk to them about their discoveries!



# Creative Construction

**Building and dramatic play go hand-in-hand!**
**Check out these amazing, creative creations from Arkansas kids!**



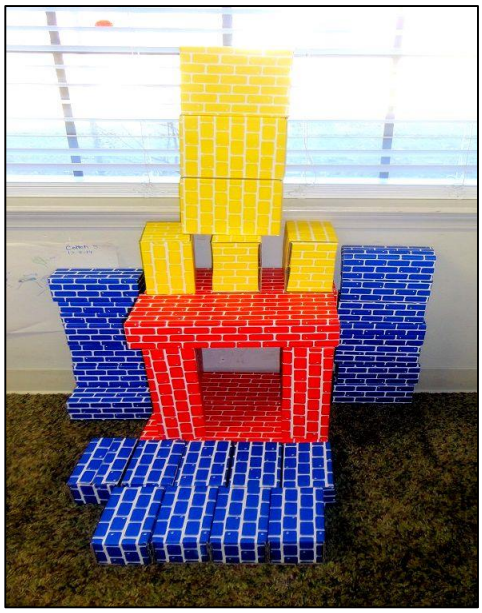
***This clever building includes a "drive-thru"***
*Photo shared by CAPCA Head Start, Conway Center*

**A unit block car is ready to roll!**
*Photo shared by Tennie Russell Primary School*

***A delicious-looking magnet tile ice cream cone***
*Photo shared by Rogers Pre-Kindergarten*

**Watch out for this "extra-long finger grabber!"**
*Photo shared by Northside Koala Preschool*

***A big block motorcycle offers full-sized fun***
*Photo shared by WCC Bear Cub Pre-K*



***Come warm yourself by our fireplace!***
*Photo shared by CAPCA Head Start, Gould Center*

***Working out with foam block "weights"***
*Photo shared by*
*Tennie Russell Primary School*

***There's plenty of room in this "two car garage"***
*Photo shared by CAPCA Head Start, Quitman Center*

**Did You Know?** Children who engage in symbolic play with materials like blocks are building the mental tools that they need to be strong readers. Looks like these creative kids are well on their way!

# Blocks and Beyond:
## Constructive Play throughout the Classroom

When children engage in constructive play, they combine smaller pieces to make something larger. They use parts to create something that has height, width, and depth. Constructive play is all about ***putting together***.

Each of the following is an example of constructive play:

- Building a structure with blocks.
- Using a hammer and nails to join scraps of wood.
- Making a "hideout" of couch cushions and blankets.
- Using masking tape to join cardboard boxes to make a pretend boat or train.

Constructive play comes naturally to children. Most adults have memories of constructive play from our own childhoods: making mud pies, building forts, or creating imaginary worlds with building blocks or sand castles. When we engaged in these activities as children, we probably didn't know that we were building math and science knowledge, problem solving skills, and strong work habits, but studies show that constructive play is one of the most effective ways for children to learn!

Because constructive play is so valuable for children, wise early childhood educators plan ways to offer many different opportunities for children to engage in construction activities throughout the classroom. On the following pages, you'll find ideas to encourage constructive play in many different areas of the classroom, as well as on the playground.

### Block building area

There is no other toy, game, or teaching tool that can take the place of a good set of blocks. Unlike other materials – which join together with tape, glue, or interlocking pieces – blocks require children to figure out how to stack and construct with flat pieces. That's serious exercise for the brain! A set of wooden unit blocks may seem expensive, but it is an investment that will last for many years. A special area for building with blocks is essential for facilitating constructive play.

**Constructive play materials in the block area**
Possibilities include, but are not limited to:

**For toddlers**

- Soft, foam blocks with vinyl covers
- Hollow cardboard blocks
- Wooden unit blocks
- Accessories, such as larger handheld cars and toy animals

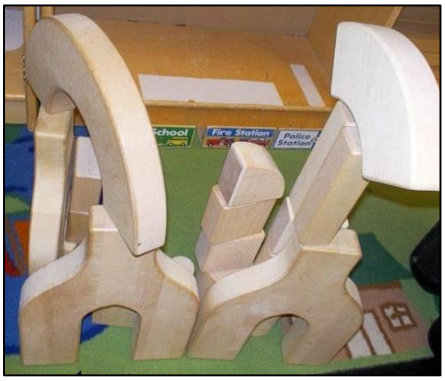
***Toddler stacks cardboard bricks***
*Photo shared by Infant Development Care & Nursery School*

**For preschoolers**

- Wooden unit blocks
- Large, hollow wooden blocks
- Homemade blocks
- Accessories, such as small toy cars, trains, and dollhouse families
- Loose parts, such as spools, buttons, and silk scarves

**For schoolagers**

- Wooden unit blocks
- Miniature bricks
- Specialty architectural blocks
- Plank blocks, such as Kapla or Keva blocks
- Accessories, such as realistic dinosaur replicas and die cast vehicles
- Loose parts, such as floral glass marbles, PVC pipe pieces and pulleys



***A 4-year-old's work with unit blocks***
*Photo shared by CAPCA Head Start, Mills Center*

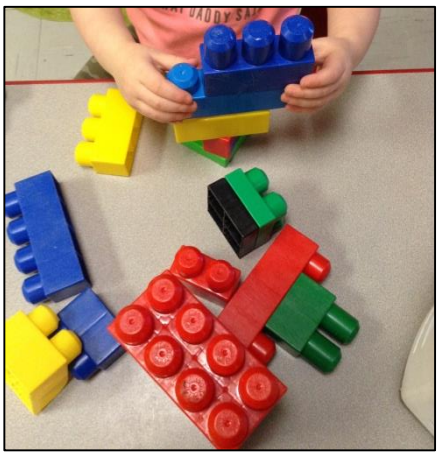
## Fine motor construction area

Unlike traditional building blocks, fine motor building materials are designed to connect to one another. That's why they're sometimes referred to as "interlocking blocks" or "manipulative blocks". Children typically work with these materials at a table. If children prefer to play on the floor, small rugs can be used to define work spaces. The larger circle time rug may also be a good place to spread out and play with fine motor construction toys.

**Constructive play materials in the fine motor area(s)**
Possibilities include, but are not limited to:

**For toddlers**

- Duplo bricks
- Peg boards with oversized, stackable pegs
- Nesting cups



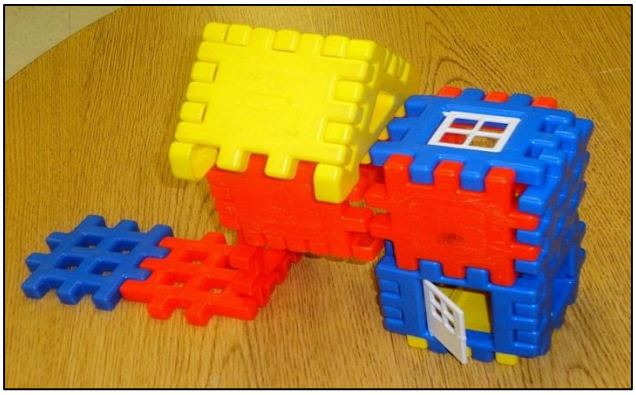
***Toddler's Duplo brick creation***
*Photo shared by Kiddie Kollege*

**For preschoolers**

- Lincoln Logs
- Tinker toys
- Smaller-sized table blocks
- Magnetic tile blocks
- Bristle blocks
- Unifix cubes and other snap-together blocks

**For schoolagers**

- Lego
- K'nex
- Marble run sets
- Playing cards for building houses



***Preschooler's waffle block house***
*Photo shared by CAPCA Head Start, Gould Center*

***Preschooler's magnetic tile "maze"***
*Photo shared by WBB Bear Cub Pre-K*


***Schoolager's log barn***
*Photo shared by Rogers Activity Center*

## Sand and water area

Periodically offer options for construction play in the popular sand and water areas. For toddlers, construction in this area is all about filling and emptying containers and making mounds of sand. For older children, the ability to move sand or water through child-created structures – such as sending sand down an elevated cardboard tube "slide" – encourages creative thinking and problem solving. Children will work intently to fine tune their designs.

**Constructive play materials in the sand/water area**
Possibilities include, but are not limited to:

**For toddlers**

- Tools for moving and piling sand: scoops, rakes, spoons, etc.
- Molds with damp sand
- Larger handheld dump trucks for sand

**For preschoolers**

- Molds with wet sand
- Construction vehicles with dirt, sand, and/or pebbles to move
- River rocks and wooden planks in sand
- Foam unit blocks in water. They float!
- Chutes, pipes, and/or tubing for water, with a way to build/modify designs

***Toddler & preschooler with construction-themed sensory tub***
*(direct supervision provided)*
*Photo shared by Harris Family Home*

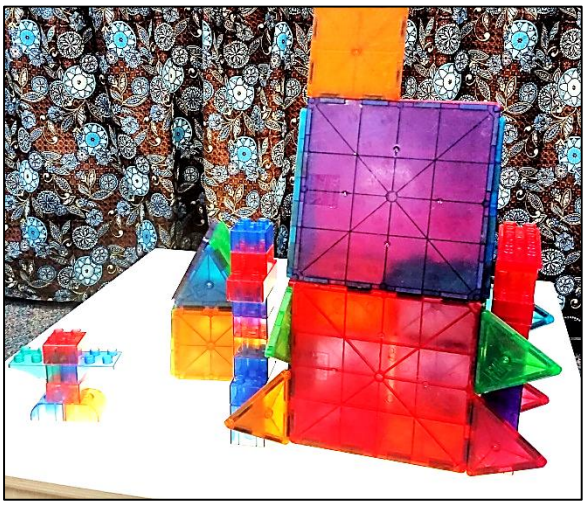
## Science area

Offering building materials here can be especially helpful when you notice crowding in the more traditional construction areas, or when you want to entice a child who usually spends his/her days in the block corner to try something new.

**Constructive play materials in the science area**
Possibilities include, but are not limited to:

**All ages**

- Transparent, interlocking blocks on a light table
- Experiments to explore inclined planes
- Construction sets with gears



***"Monster Village"***
***Preschooler's transparent interlocking blocks on light table***
*Photo shared by Bayyari Elementary Pre-K*

## Woodworking area

A woodworking center with real tools can be a fit for programs were classroom management is strong and close, individualized supervision is possible. This area feels uniquely authentic, powerful, and "grown up" to children, who take pride in learning to use tools with skill and care to accomplish challenging work.

For programs with very young children, or any program where real woodworking feels too risky, toy tool sets may be preferred.

**Constructive play materials in the woodworking area**

Possibilities include, but are not limited to:

**For toddlers**

- Pounding benches with wooden mallets
- Toy workbench with pieces that can be joined using large toy nuts and bolts

**For preschoolers**

- Introductory hammer activities, such as tapping golf tees into a piece of floral foam
- Scraps of wood with sandpaper and wood glue
- Large (real) nuts and bolts to join pieces of wood with pre-drilled holes
- With very careful introduction, supervision, and guidance: real tools, including hammer, manual screwdrivers, small handheld saw, and manual rotary drill

***Preschooler works with hammer and nails.***
*Photo shared by Building Bridges*

**For schoolagers**

- With very careful introduction, supervision, and guidance: real tools, including hammer, manual and battery operated screwdrivers, handheld manual saw, and manual rotary drill.
- Old, non-working electronic devices to disassemble with tools.

***Schoolager uses low-powered drill press especially designed for soft balsa wood.***
*Photo shared by Kearney Family Home*

## Art area

Here, children use constructive skills each time they work with three-dimensional art materials. Special sculpture projects – planned periodically throughout the year – can complement and build upon skills honed with everyday art activities.

**Constructive play materials in the art area**
Possibilities include, but are not limited to:

**For toddlers**

- Play-dough and clay, with close supervision

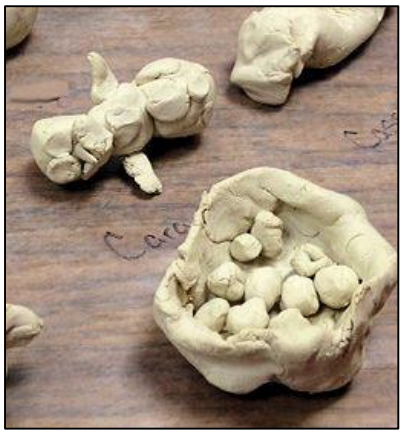
***Toddler's animal tracks in play-dough***
*Photo shared by Harris Family Home.*

**For preschoolers**

- Play-dough paired with popsicle sticks, wooden spools, and/or other simple materials that can be joined with the dough
- Wikki Stix (waxed yarn) or chenille stems
- Clean "recyclables" – such as cardboard gift wrap tubes, cereal boxes, and plastic bottles – with masking tape for joining
- Children's modeling wax
- Clay

**For schoolagers**

- Wikki Stix or chenille stems
- Foil sheets for sculpting
- Paper mache projects
- Modeling clay or polymer clay
- Clay



***Schoolagers' clay sculptures***
*Photo shared by Adventure Club.*

## Outdoor play area

Constructive play shouldn't have to end when the group heads outside to play! Constructive play materials outdoors give children the freedom to work on a larger scale, using their whole bodies as they build. Consider creating one or more "construction zones" on your playground.

**Constructive play materials in the outdoor play area**
Possibilities include, but are not limited to:

**For toddlers**

- Large, weatherproof plastic blocks
- Sand box area, with close supervision

**For preschoolers**

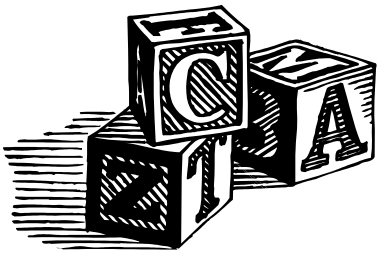
- Large, weatherproof blocks
- Milk crates
- Oversized interlocking building sets, such as very large waffle blocks
- Sand box or gravel pit with construction vehicles and props
- Water wall with repositionable chutes

**For schoolagers**

- Milk crates
- PVC pipe
- Commercial or homemade materials for building tipis, forts, and clubhouses, with close supervision
- Outdoor woodworking area


***Cardboard boxes in the play yard are fun while they last!***

# Solutions for Common Construction Challenges

| Challenge: | Try This: |
|---|---|
| **Children bounce around during play time. They don't seem to stay and play anywhere.**<br><br>  | **This is typical behavior when materials are new**, or when children are new to the program. Children are excited to see and do everything, and it can take some time for them to settle down.<br><br>**Some children might not know how to use constructive play materials** with purpose. This is especially true when children come from home or childcare environments where there are few materials for construction. Engage this child by inviting him/her to join the teacher in a task-oriented goal. For example, "*Let's see* if *we can stack all of the red blocks."*<br>In time, this child's ability to focus on play will increase.<br><br>Bouncing between materials can also be a sign that children don't have **enough time to settle into their play**. When play times are very brief, children quickly learn that there is no way to be successful with complex play – almost as soon as they start, it is time to stop and clean up! Ensure that scheduled play periods allow plenty of time for children to work. Most preschoolers thrive when the schedule provides blocks of at least 40 minutes of playtime at once. |
| **Children pull blocks off the shelf, dump out toys, and make a big mess.**<br><br>**I feel like we're always tripping over the toys!** | **Remember that dumping and filling is a natural stage of development for toddlers and younger preschoolers.**<br><br>Instead of fussing at children for dumping out toys, provide at least some containers that can be emptied and make a game of picking up again:<br>*"Can you find all of the blue pieces?"*<br>*"Show me how fast you are at filling up the box!"* |

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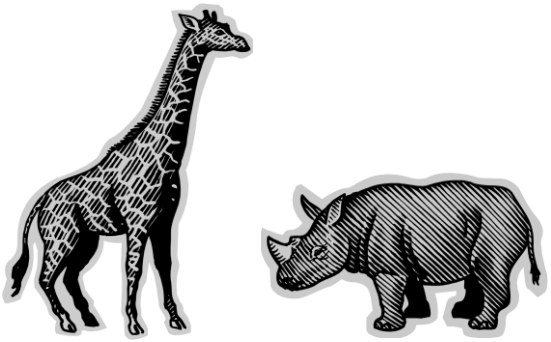
| **I feel like we're always tripping over the toys!** (continued) | **Children may dig through materials when it is hard to reach what they need.** They are less aware of mess than adults and focused on their play goals. Eliminate the need to "dump and dig" to find toys by storing different kinds of materials in individual bins or baskets, giving each basket a special place on the shelf.<br><br>**Teach children to "choose, use, and replace" with consistent guidance.** Model and talk about this skill. Try to catch children at just the right moment to give well-timed reminders. Use "when-then" statements such as *"When you've put your play-dough away, then you'll be ready to work with the Tinker Toys."* |
| **Only certain children build. Some children seem to avoid the block area.**<br><br>  | The most confident builders in a group can sometimes monopolize the building area. More timid children may be unsure about engaging in play with these boisterous builders.<br><br>**Offer construction experiences in other areas of the room** to catch the attention of the children who most often pick the block center. For example, you might put miniature bricks, fine gravel, and construction vehicles in your sand table. When the eager builders are attracted to new play spaces, the block area may feel more accessible to rookie builders.<br><br>Some girls may think of common block center props – such as trucks and dinosaurs – as "boy toys". What would happen if you swapped these out for more **gender-neutral toys**, such as plastic coins and jewels, zoo animals, and sturdy seashells? |

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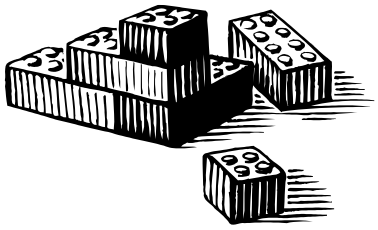
| **All they seem to do with the building toys is make guns, but we have a firm "no guns at school" rule.** | Gun play appeals to many children because it is exciting and feels powerful. If "no guns at school" is your program's rule, find ways to **redirect play** to something powerful, exciting, *and* appropriate. How about making spaceships, firefighter's hoses, or superhero hideouts? |
| **Children argue over blocks and materials.**<br><br>**They seem to spend more time bickering than playing!**<br><br>  | **Ensure that there enough blocks and duplicates** of popular items. For example, the block area might include several trucks, several dinosaurs, etc. to avoid undue competition over any one item.<br><br>Mature builders may use 100 blocks or more, each. If there aren't enough blocks to share without undue competition and it isn't possible to buy more blocks, try supplementing your building area with homemade materials, such as cardboard block boxes and frozen juice tube "tunnels".<br><br>**Early years are social skills-building years; disputes over toys are normal and natural.** Conflicts over construction actually provide perfect opportunities for adults to coach children as they learn to work together. Rather than simply expecting children to share and get along, help children talk through specific strategies to take turns and solve problems:<br><br>*"It looks like you need more space so that you can both build your tall towers without bumping into one another. Ella, move over here, where there is more room."*<br><br>*"It sounds like you both want to use the dump truck. Let's see if we can figure this out..."*<br><br>*"He is using the purple play-dough now, but he will let you know when he is done so that you can have it next. Would you like to use the blue play-dough while you wait?"* |

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| **Children disrupt one another's work. We see lots of crying and upset from children who are "bothered" by others.**<br><br>  | **Do you have enough floor space?** Building areas can feel especially crowded when there isn't enough room for the materials and children. Block building areas should be as spacious as possible. And, naturally, big toys - such as oversized cardboard bricks and large trucks - require very large spaces for play. If your space is limited, consider smaller alternatives, such as standard-sized unit blocks and Hot Wheels cars.<br><br>Provide enough space between work spaces and shelves to allow children to **reach materials without crowding.** For example, consider using masking tape to mark a “loading zone" that extends about 14 inches around the block shelf. This will create a way for children to fetch more blocks and props without interfering with other children's structures.<br><br>While it is important to have some social places in the classroom where three or more children can play together, it can also be helpful to have **some spaces for just one or two children.** Trays, mats, or small rugs can help define individual work spaces for focused work with play-dough and small building toys, like Legos. Teach children to ask their friend's permission to join if they would like to work together with these materials. |
| **We have plenty of building materials, but children seem bored.** | **Rotate toys or pair them in new ways to rekindle children's interest.** For example, pair small animal figures with wooden table blocks or try using trucks to make tracks in play-dough.<br><br>**Join in play with children to help them become involved in more complex play.** *"These plastic animals remind me of the animals I saw at the zoo. I wonder if we could use the blocks to make a cage for each of them?"* |

| | |
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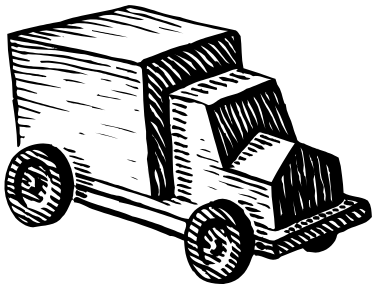
| **Children seem bored.** (continued) | **As children grow, materials can grow with them** to provide new challenges. For example, introduce wooden unit blocks to older toddlers who have outgrown the soft vinyl blocks, or swap large, chunky Duplo bricks for smaller Legos in the pre-K room. |
| **Children won't clean up their blocks and other materials at the end of play time.**<br><br>  | **Provide a gentle warning several minutes before the end of playtime.** Move close to children who are engrossed in play and gain their attention to make sure that they hear you. Talk about what to expect next.<br><br>**Use auditory and visual cues to help children "switch gears" and make clean-up time more fun.**<br>These could include:<br><br>*A "stop, look, and listen" signal such as a chime or gong. Pause and regroup before cleaning begins.*<br><br>*A special clean up time song.*<br><br>*A beat-the-clock game to see if preschoolers and schoolagers can pick up at "record speed".*<br><br>*A cardboard tube "telescope", used by the teacher to look for children who are helping. Make a game of it - "I spy Aishia using her strong muscles to pick up the big blocks!"*<br><br>*High fives or other celebration when the job is done. Make a big deal about teamwork!*<br><br>**Break hard tasks down into simple steps.**<br>Simply telling children to "clean up" may be too vague. Try giving more specific instructions such as:<br><br>*"Stack the wooden blocks on the bottom shelf."*<br><br>*"Put the zoo animals back in their basket."*<br><br>*"Park the trucks on the top shelf."* |

# Constructing with School-agers: Full STEAM Ahead!

When do children outgrow constructive play with blocks and other building materials?
The best answer to that question might be "never"! As long as the building materials are complex and interesting enough to provide challenge, kids are likely to enjoy block/building play throughout elementary and middle school and beyond.

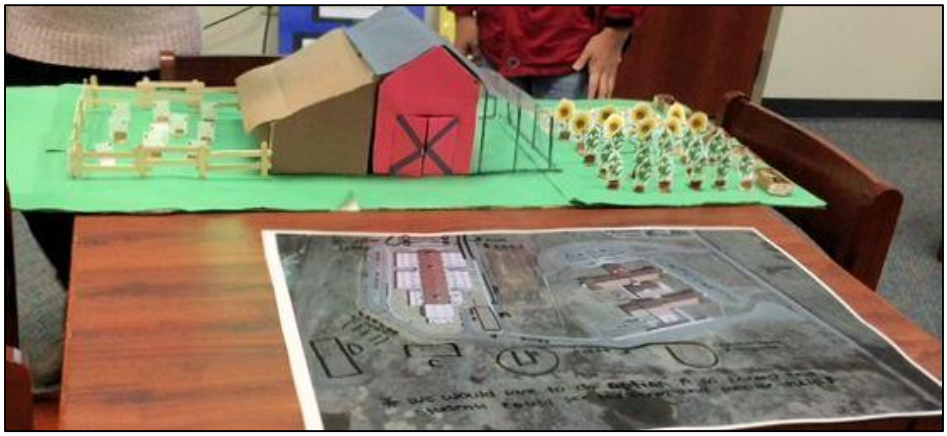
Our schoolage youth are spending more time than ever before on electronic devices at home and school. Blocks, by comparison, are sturdy and physically substantial. Interacting with them requires the use of the body and senses in a much different way than computerized or paper-and-pencil tasks. Building is an intrinsically rewarding task; schoolagers plan, concentrate, and work hard to complete complex structures and experience a sense of pride and accomplishment when they succeed.

Age appropriate blocks and building materials are a perfect addition to an out-of-school time STEAM (Science, Technology, Engineering, Art, and Mathematics) enrichment program. Students enjoy using blocks for free choice activities, as well as for design challenges related to creating structures.
Here are some ways that block building and construction play support elements of STEAM:

- Second graders Talia, Lily, and Thomas work intently with small, wooden plank blocks. They're building an intricate structure that is as tall as they are! In the process, they are practicing measurement, learning about symmetry, and exercising their creative thinking skills.

- Caleb and Natalie design a marble "rollercoaster" from wooden blocks and lengths of tubular foam pipe insulation. They're experimenting with gravity, momentum, and kinetic energy.

- The middle school group designs and tests bridges made of drinking straws and Scotch tape. Whose design will be able to hold the most weight? They're exploring geometry and engineering.



***Designing a School Farm***
*Photo shared by Sonora Middle School*

# Benefits for Builders

**Building in the early grades**

A growing body of research suggests that blocks and construction materials are one of the most valuable ingredients for our out-of-school-time spaces for youth of all ages. A group of 45 kindergarteners and first graders in North Carolina were given opportunities to work with building and construction materials – wooden blocks, 3-D art materials, Lego, and more – each day after school. At the end of the 28-week-study, the children showed a surprising increase in spatial reasoning, mathematical ability, and thinking skills – especially when compared to children who had not been given the opportunity to use the building materials each day (Grissmer et al., 2013).

**Construction for older kids, tweens, and teens**

Benefits of constructive play were significant for older builders, too. A recent study strongly linked constructive play with materials like Lego with gains in spatial reasoning and the ability to solve challenging math word problems among sixth graders. These gains carried over to performance on standardized tests (Oostermeijer et al., 2014; Richardson et al., 2014).

***Domino Designs***
*Photo shared by Adventure Club*

***Electrical Engineering***
*Photo shared by Kearney Family Home*

**Lifelong benefits for builders**

A survey of college-educated adults with careers in STEM fields – science, technology, engineering, and mathematics – indicated that these individuals were "far more likely than the average American" to have engaged in activities related to woodworking, mechanics, structure-building, and electronics while growing up. Involvement in these activities was also linked to invention; kids who construct are more likely to create and patent an invention when they grow up! (LaMore et al., 2013).


Grissmer, D. W., Mashburn, A. J., Cottone, A. J., Chen, W. B., Brock, L. L., & Murrah, W. M., et al. (2013). Play-based after-school curriculum improves measures of visuospatial and math skills and classroom behavior for high-risk K-1 children. Paper presented at the Society for Research in Child Development, Seattle, WA, April 2013.

Oostermeijer, M., Boonen, J. H., & Jolles, J. (2014). The relation between children's constructive play activities, spatial ability, and mathematical word problem-solving performance: a mediation analysis in sixth-grade students. *Frontiers in Psychology*, 5, Article 782.

LaMore, R., Root-Bernstein, R., Schweitzer, J. H., Lawton, J. L., Roraback, E., et al. (2013). *Arts and Crafts: Critical to Economic Innovation Economic Development Quarterly* 27(3), 221-22.

# Setting the Stage for Successful Construction with Schoolagers

Construction materials are a wise investment for programs serving youth in out-of-school-time care, including afterschool programs and summer day camps. These materials are appealing and engaging for kids, and can be linked to impressive gains in academic performance.

Ready to incorporate construction into your schoolage youth program?
Follow these guidelines to optimize students' opportunities to enjoy and benefit from building activities.

**Have ample materials in good repair.** This way, kids won't have to compete for materials or experience frustration when parts that they need for a design are broken or missing. While building benefits every student, no one will have a successful experience if there aren't enough pieces to go around. If your construction materials are limited, offer them alongside several other popular choices – such as art materials and board games – to ensure that everyone can participate fully in something they enjoy. Or, offer construction as one of several appealing clubs for students to choose.

**Provide plenty of time and space to build.**
Allow builders to spread out with materials to avoid conflicts and accidental collisions that detract from building. Provide blocks of work time that enable builders to plan and work with purpose on complex designs. Consider finding a way to allow builders to save their work from session to session, returning to work on their creations over the course of hours, days, or even weeks.

**Rotate materials to provide variety.** Different builders are naturally drawn to different materials. Some like to build huge structures, while others prefer to craft tiny, handheld creations. Wood, cardboard, paper, metal, and plastic may all appeal to various builders. By offering diverse building experiences throughout the year, you're sure to find something that feels like a fit each student.

**Match the materials to the ages and abilities of the students.** Kindergarten and first grade students will enjoy building with wooden table blocks and large cardboard bricks, while older students will prefer something that is more challenging. On the following pages, you'll find top recommendations for construction materials for each age group.

***Modern House (Plank Blocks)***
*Photo shared by Harris Family Home*

# Kid-Tested Building Sets for Schoolage Youth

## For Kindergarten and First Grade Builders

**Kapla and Keva planks**


These little, wooden planks are deceptively simple-looking, but they hold tremendous appeal for builders. Plank blocks can be enjoyed by kids of all ages, making them a perfect pick for multi-age programs. *Available at Target stores, as well as online at Fat Brain Toys, Amazon, and elsewhere.*

**Marble runs**

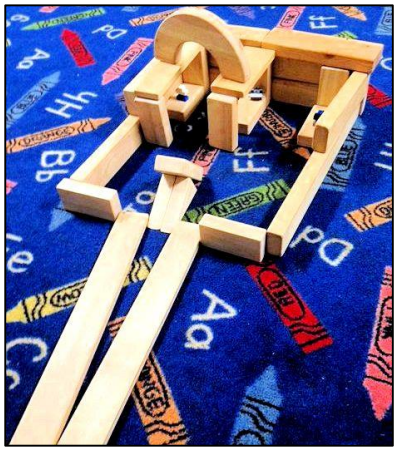
Marble runs made of wood or plastic challenge kids to design a path to successfully carry a marble from the top of the track to the bottom. This is a fantastic toy to encourage problem solving and collaboration. Commercial sets are available at most toy retailers, or search *Pinterest* for ways to make homemade marble runs from pool noodles, PVC pipe, and even paper plates!

**Toobers and Zots**

This set features bendable wires covered in soft foam. The pieces can be combined to create zany hats, freestanding creatures, and more. Toobers and Zots will appeal to the "reluctant builders" – kids who may not be drawn to more traditional construction materials. *Available online at Fat Brain Toys, Amazon, and elsewhere.*

**Wooden architectural blocks**

Children don't outgrow wooden blocks as the preschool years come to a close. In fact, they're just beginning to be able to build and complete complex structures. Continue to offer wooden unit blocks to school-agers for creative, cooperative play. Special architectural sets – inspired by pyramids, coliseums, castles, and more – are also available. *Look for wooden architectural blocks at educational supply stores and your local toy store, as well as online at Community Playthings, Fat Brain Toys, Amazon, and elsewhere.*



***K-1 Unit Block Structure***
*Photo shared by Gentry Early Learning Academy*

## For 2nd – 4th Grade Builders

**K'nex**

Plastic rods snap into a variety of connectors for open-ended construction. A website - www.knex.com - provides free STEAM lesson plans to help educators introduce science and engineering concepts using K'nex. Basic K'nex are suited for all elementary-age builders, while more complex, motorized K'nex sets are available to challenge older kids and teens. *Available at Wal-Mart and Target, as well as at most online toy retailers.*

**Lego**

Since the 1950's, Lego bricks have been a perpetual favorite with kids and continue to be immensely popular in youth programs. *Available at most stores and online retailers that sell toys.*

***"Hamster's Hut" (Lego)***
*Photo shared by Kearney Family Home*

**Playing cards**

All you need is a deck of cards or two and a clear, stable tabletop for building! Kids will concentrate and put their hand-eye coordination to the test as they carefully stack card houses.

It only takes a sneeze to flatten the whole, fragile structure, but half the fun is scooping the cards up to begin again. *Playing cards are widely available at most stores.*

**Snap Circuits, Jr. and Snap Circuits**
This award-winning toy features color-coded circuit components that can be combined on a base in many different ways. Arrange and rearrange the pieces to experiment with things like electric switches, integrated circuits, digital circuits, and fuses while creating lights, sirens, and more. *Snap Circuits are available online at Fat Brain Toys, Amazon, and elsewhere.*


**Take-apart electronics**
It's fun to build and put things together, but many school-agers are fascinated with taking things apart! Offer old, non-working electronic devices – such as VCRs, clocks, and printers – along with screwdrivers and other basic tools. Remove any batteries before you begin and teach kids safety rules regarding tool use. (For example, a screwdriver is for carefully removing screws, and not to be used like a hammer.) Once kids get everything disassembled, encourage them to recombine the pieces to make their own, imaginative inventions. *Thrift shops and yard sales are a perfect place to find your next take-apart project.*

## For Builders in Middle School and Beyond

**Engino**
Engino sets are specially designed to teach principles of physics and engineering, providing hands on experiences with levers, pulleys, cams, gears, cables, and more. Sets range in complexity to suit builders of varying ages and abilities and adapters are available to support students' own balsa wood designs. *Engino sets are available online at Fat Brain Toys, Amazon, and elsewhere.*

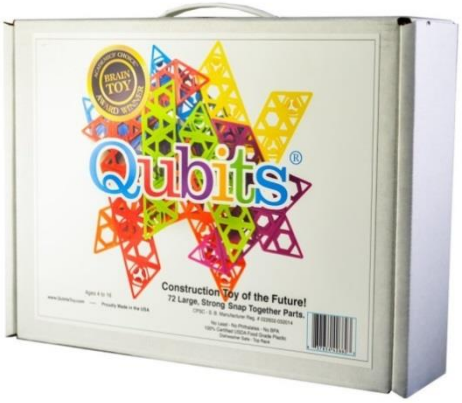
**littleBits**
Created by an accomplished engineer, marvelously modern littleBits are designed to help kids figure out circuit-making as they power lights, sounds, movement and more. Compatible with Lego sets and many ideas for pairing littleBits with household materials can be found on the manufacturer's website: http://littlebits.cc/browse-lessons. Close supervision recommended due to the delicate nature of the pieces. *littleBits can be found online at Fat Brain Toys, Amazon, and elsewhere.*

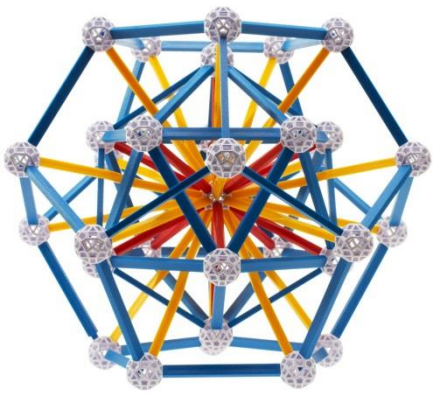
***littleBits have been used to design and wire a working alarm system on this Lego house!***

**Qubits**

Qubits may appear simple at first, but once kids get the hang of snapping them together to form geometric structures; they'll soon be building large, lightweight creations of surprising complexity!

Because Qubits are dishwasher safe and contain no small pieces, they're especially suitable for multi-age environments. Available in bright colors, or sophisticated black and white; *look for Qubits online at Amazon.*



**Zome Tool**

These sets of rods and spheres challenge kids to build elaborate domes and structures. Specialized kits are also available to use Zome for learning about math and science topics, including crystals, DNA, astronomy, and more! Pair Zome with soap solution to create square bubbles, or construct a Zome bridge that spans the classroom.

The Zome website – www.zometool.com - offers printable challenge cards and other free resources for educators. *Zome Tool kits are available online at Fat Brain Toys, Amazon, and elsewhere.*

# No More "*We're Bored!*"
## Boredom-Buster Construction for Schoolagers

*"We're bored!"*
At home or at school, this can be a common call for our schoolagers. When a summer field trip is rained out or an unexpected snow day afternoon seems to stretch on without end, it can be handy to have something new to do. Each of the following projects use materials you probably already have, require very let prep work or set up, and can engage kids in creative, construction fun.

**Make paper airplanes.**
Encourage students to experiment to see how a plane's flight changes when you modify the design. For example, change the weight by adding paperclips or trim the wings using scissors. After a period for experimentation, put on an airshow to see which planes can fly the farthest and which can do the most impressive stunts!

**Stack cups.**
Offer a large package of paper or plastic disposable cups. Can students stack a tower that incorporates all of the cups? When complete, knock it down and begin again! To mix it up, try using sheets of construction paper or cardstock to create platforms between the cups.

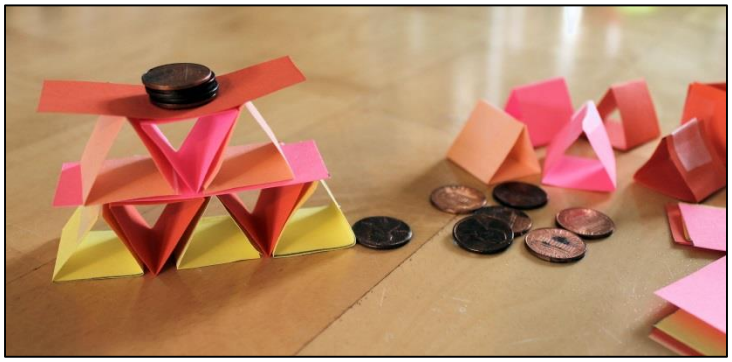
***Stack up the cups, knock them down, and repeat!***
*Photo shared by Gunderman Family Home*

**Offer a design challenge.**
Give new life to familiar construction materials – like Lego, Lincoln Logs, playing cards, and wooden blocks – by prompting kids to design something based on a theme. Challenge them to build their dream home, design an amusement park ride, or create a set for a movie.

**Construct with triangle towers.**
Cut paper or index cards into strips measuring one inch wide and three inches long. Fold into triangles and secure each with a piece of tape. You may also wish to leave some pieces flat to serve as planks and platforms. Once you have a pile of paper triangles, you can use them in many ways:

- Build a tall tower
- Create a bridge that is as long or as strong as possible
- Stack up triangles to make targets for tossing or bowling games.

Triangle towers activity inspired by *The Big Book of Science Things to Make and Do* by Rebecca Gilpin and Leonie Pratt.

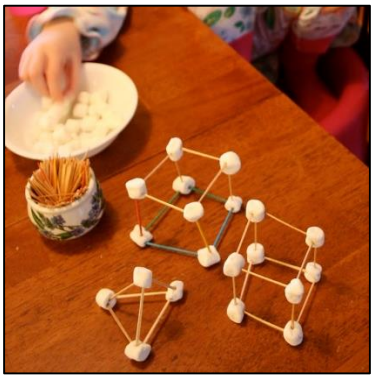


***Tiny paper triangles are surprisingly strong!***

**Design a cardboard arcade.**
Gather a stack of cardboard boxes, tubes, and packing material. Challenge teams of students to make their own, working, carnival/arcade games from the materials. For inspiration, check out 9-year-old Caine's cardboard arcade: http://cainesarcade.com/

When construction time is done, make tickets and enjoy playing all of the games. Or, invite younger kids to come for a special visit to your arcade.

**Build with toothpicks.**
Combine toothpicks into structures using almost any moist "joiner", such as mini marshmallows, gumdrops, grapes, or balls of play-dough or modeling clay.



***Toothpicks and marshmallows***
*Photo shared by Harris Family Home*

# Zoning in on Family Involvement

When caring adults recognize the value of constructive play, that's a wonderful thing for children. Consider what might happen if schools, families, and even whole communities worked together to support young builders! Here are some ways to connect constructive play with family involvement.

**Create displays for families.**
Pair photos of children at work with blocks and building materials with information for families about what they are learning as they work and play. In addition to bulletin boards with photos, consider using shadow boxes to display children's work with clay, Lego bricks, and other 3-dimensional materials. Placing displays of this sort in high traffic spaces – such as lobbies and hallways – will help parents learn about the cognitive, physical, and social skills being built through constructive play.


***Hallway display of architectural columns crafted from newspaper and cardboard.***
*Photo shared by Sonora Middle School*

**Invite families to contribute to construction projects.**
Collect cereal boxes, coffee cans, cardboard packing tubes, or other "clean collectibles." Seek out family career connections that can lead to donations of unusual materials for construction play. Possibilities include pizza boxes, industrial-sized spools, milk crates, foam tubing, PVC pipe, and more. Anything that children can safely carry and stack can be repurposed. Parents, grandparents, and other family members who enjoy using tools may also be willing to help make wooden blocks for your program.

**Host a construction-themed family night.**
Science and math nights are popular, so why not try a construction night? Create stations where families and children work together to build with blocks, construct with play-dough and other art materials, and try out various interlocking building toys. Provide information for families about how activities such as these build math skills, problem solving, and creative thinking skills.

An event where children and families build together in big ways – such as covering the entire gym floor with stacked cups – would make a great photo opportunity. Don't forget to invite your local newspaper and television newscasters to join you!

# Field Trips & Special Guests to Inspire Young Builders

- Invite an architect to tell about his/her work.
- Visit a make-your-own pottery studio.
- Most home improvement stores offer workshops where kids can make their own projects, such as birdhouses and wooden vehicles. Ask about scheduling a special session for your group.
- Visit an archeological site.
- Take a tour of a factory, recycling center, or power plant.
- Visit interesting local bridges to take photos and/or make sketches. Afterwards, use what you've learned to construct your own bridges using building materials.

***Brooklyn Bridge***
*Shared with permission by City and Country School*

*Using wooden blocks to create a large-scale model of a famous landmark is a much-anticipated annual project for the 7-year-olds at the City and Country School in New York. Construction begins after students spend weeks researching and visiting their site and drawing detailed plans for their project.*

*To see more, visit [www.cityandcountry.org](http://www.cityandcountry.org)*

# 50 Fabulous Books for Builders

What do *books* have to do with *building*? Lots! A great book can become a starting place for inspiration, a resource to find out more as spontaneous questions arise, or a perfect wrap-up activity when the project is finished.

Any of the following make excellent construction-related picks:

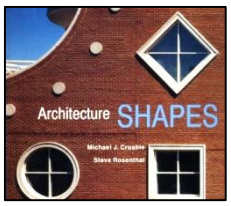
- Books about architecture and/or recognizable structures, such as castles, bridges, and skyscrapers.
- Books about construction sites and machines – bulldozers, dump trucks, etc.
- Books that highlight household tools, carpentry, and repair.
- Books with illustrations made from 3-dimensional materials like clay and household objects.
- And, of course, books about kids working with blocks.

These books can be placed in/near the spaces where children work with materials or in the children's library, or shared by an adult with large or small groups of children. When adults purposefully help children connect literature with real life construction experiences, knowledge blossoms. Here are some examples of adult statements that support meaningful work and play:

> *"You've built a castle? I think we have a book about castles here, in our book basket. Would you like to read it with me?"*
>
> *"I notice that you have been interested in our dump trucks and other construction toys lately. When we go to the library, let's ask the librarian to recommend some books that can help us learn more about construction sites."*
>
> *"As we start our study about bridges, I've added some new books about bridges in our classroom library. Perhaps you'd like to look at them during play time."*

On the following pages, you'll find book picks for each age group, along with resource books for adults. Happy reading!

# Books for Infants & Toddlers

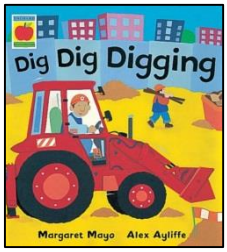



***Architecture Shapes*** by Michael J. Crosbie and Steve Rosenthal, John Wiley & Sons, 1993

Created by award-winning architects, this gentle photo book highlights the shapes of windows, doors, and more.

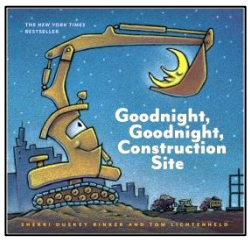
***Baby's First Book Blocks*** (boxed set) by Dan Stiles, POW!, 2014

An unusual set of small, stackable board books; each page features bold, geometric designs intended to spark visual interest.




***Dig Dig Digging*** by Margaret Mayo, Henry Holt and Co., 2006

Meet 11 different vehicles that work all day, including construction vehicles, helicopters, and cranes. This one is sure to be popular with truck-loving toddlers!




***Goodnight, Goodnight, Construction Site*** by Sherri Duskey Rinker and Tom Lichtenheld, Chronicle Books, 2011

"The sun has set, the work is done. It's time for trucks to end their fun." This sweet book has quickly become a favorite of toddlers everywhere.

***Hands Can*** by Cheryl Willis Hudson, Candlewick, 2007

Photos of children using their hands in many ways: molding clay, fixing trucks, playing outdoors, and more. A sturdy board book especially suited for babies and young toddlers.


***Meeow and the Blue Table*** by Sebastien Braun, Boxer Books, 2012

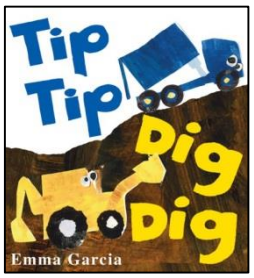
Black cat Meeow and his animal playmates use blocks and costumes to create an imaginary world under the table. Bright, simple illustrations have visual appeal for younger toddlers, while older toddlers may be inspired to play like Meeow.

***Playtown*** by Roger Priddy, Priddy Book, 2014

A tabbed board book takes children on tour of a busy town, including the market, a hotel, the hospital, the park, and the airport. There's a lot to see and talk about!

***The Tool Box*** by Anne Rockwell, Walker Childrens, 2006

A quiet, charming board book featuring a small boy exploring the items in his father's toolbox; this one will especially appeal to toddlers who are fascinated with tools.



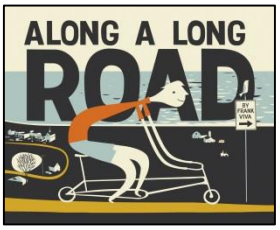

***Tip Tip Dig Dig*** by Emma Garcia, Boxer Books, 2013

This bright, action filled board book follows construction vehicles as they build a playground. Also look for *Tap Tap Bang Bang*, a tool-filled title by the same author.

***Trains Go*** by Steve Light, Chronicle Books, 2012

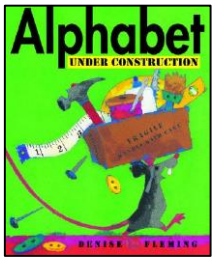
This one is all about the train sounds! Be prepared to zoooosh, ding, clang, and toot enthusiastically as you share this beautifully-illustrated board book!

## Books for Preschooler & Kindergarteners




***Along a Long Road*** by Frank Viva, Little, Brown Books for Young Readers. 2011

This visually fascinating, award winning picture book follows a cyclist as he rides through city and country, over bridges, and through tunnels.

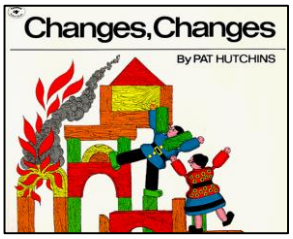



***Alphabet Under Construction*** by Denise Fleming, Square Fish, 2006

Mouse sets out to build and craft the entire alphabet. Each letter highlights a different construction strategy: airbrushing, carving, quilting, welding, and more. This book offers lots of opportunities to practice new words!

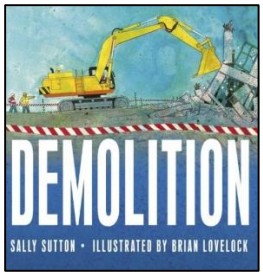
***Block City*** by Robert Louis Stevenson and Daniel Kirk, Simon & Schuster Books for Young Readers, 2005

A poem from 1883 is paired with modern illustrations to tell the timeless tale of an imaginary world created by a child playing with blocks.




***Changes, Changes*** by Pat Hutchins, Aladdin, 1987

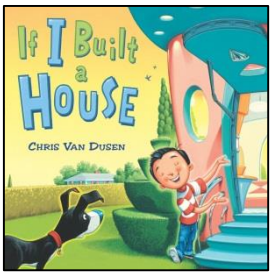
This wordless picture book follows a little wooden couple as they overcome adversity in daring and creative ways – using their wooden blocks, of course!




***Demolition*** by Sally Sutton, Candlewick, 2012

Workers use massive machines to tear down a tall building. An action-filled text and realistic illustrations make this a favorite for preschoolers. A picture glossary at the back of the book is perfect for expanding vocabulary.

***If I Built a House*** by Chris Van Dusen, Dial, 2012




Young Jack imagines all of the fabulous features he would add to his dream home – a trampoline path, a ball pit, a gigantic slide, and more. Keep an eye out for Jack's architectural models made with Lego bricks, Tinker Toys, and wooden log toys.

***Iggy Peck, Architect*** by Andrea Beatty and David Roberts, Harry N. Abrams, 2007

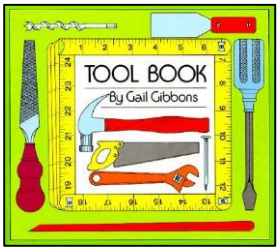
From the time he was a toddler, Iggy Peck has had a talent for creating structures from everything around him. But what happens when his second grade teacher discourages him from building? Whimsical illustrations and a rhyming text make this a fun read-aloud for older preschoolers and kindergarteners. The follow-up title, *Rosie Revere, Engineer,* is also worth a read.

***It's Picture Day Today*!** by Megan McDonald and Katherine Tillotson, Atheneum Books, 2009


It all begins with the buttons, followed by the feather, the strings, and the springs. When glue finally arrives, the swirling "bits and pieces" transform themselves into a collage of a class of children – all ready for their group portrait.

***Not a Box*** by Antoinette Portis, HarperCollins, 2006

What can you do with a cardboard box? This simple, repetitive book will inspire creative play. Seek out the Spanish-language version – *No Es Una Caja* – as a "just right" read aloud for young language learners.



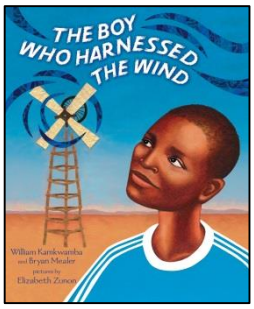

***Tool Book*** by Gail Gibbons, Holiday House, 1982

This non-fiction book names and explains the function of each household tool. Great for the classroom bookshelf and sharing one-on-one.

## Books for Schoolagers, 1st – 3rd grade

***Amazing Buildings*** by Kate Hayden, PH - DK Titles, 2003.

A Level 2 reader recommended for ages 6 – 8 pairs a simple text with crisp photos of castles, coliseums, and cathedrals.



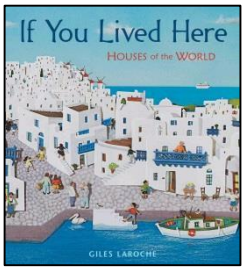

***The Boy Who Harnessed the Wind: Picture Book Edition*** by William Kamkwamba and Bryan Mealer, Dial Books for Young Readers, 2012

This picture book edition of the biography of 14-year-old William Kamkwamba tells the story of a brilliant young man who saved his Malawi village from drought by researching, designing, and constructing a windmill to draw water to irrigate the fields and generate electricity.

For older schoolagers, try the youth edition of the same story: *The Boy Who Harnessed the Wind: Young Readers Edition* (Dial, 2015). Consider pairing the two editions as part of a project for multi-age groups.


***The Fort on Fourth Street: A Story About the Six Simple Machines*** by Lois Spangler, Sylvan Dell Publishing, 2013

A grandfather and granddaughter use simple machines - lever, pulley, inclined plane, wheel and axle, screw, and wedge - to construct a backyard hide-out. The back of the book includes extension activities for hands-on exploration of simple machines, along with a link to a guide for parents and educators.

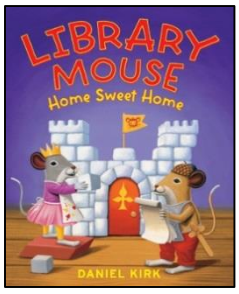



***If You Lived Here: Houses of the World*** by Giles Laroche, HMH Books for Young Readers, 2011

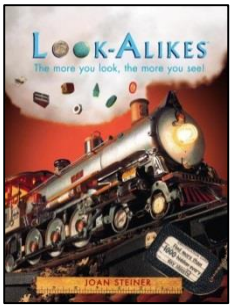
Would you rather live in a tulou, a chalet, or a yurt? This beautifully illustrated book takes young readers around the world to learn how and why homes are different and alike. A perfect starting place for cultural projects!

***Library Mouse: Home Sweet Home*** by Daniel Kirk, Harry N. Abrams, 2013

When the library is scheduled for renovation, Sam and Sarah - the library mice - must construct a new home for themselves. Using library books about architectural styles as a starting point, they try out many different homes. Architectural photos and a glossary pair facts with the fanciful story.

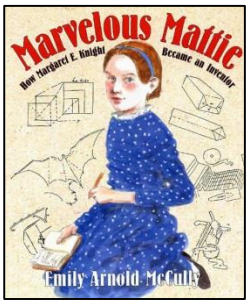


***Look Alikes*** by John Steiner, Little, Brown Books for Young Readers, 2003




At first glance, the photos in this book depict nostalgic scenes of a train station, city street, and small town store. Look closely and you'll see that every single thing in the book is made of small parts such as safety pins, bottle caps, and buttons. There are over 1000 hidden objects! Pick it up for a few, quick minutes, or pore over it for an hour or more – this is a book kids will return to again and again, and it may inspire their own 3-D artwork.

***Marvelous Mattie: How Margaret E. Knight Became an Inventor*** by Emily Arnold McCully, Farrar, Straus and Giroux, 2006

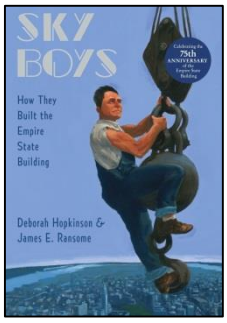



This biography of the first woman to receive a U.S. patent begins with her childhood as a tool-savvy, mechanically-minded young lady who designed and built sleds, kites, and toys for her brothers. By age twelve, she had designed a safer loom to protect textile workers, and she went on to be a successful adult inventor.

***Roberto, the Insect Architect*** by Nina Laden, Chronicle Books, 2007

What happens when a termite would rather construct with wood than eat it? This is a clever picture book that is also suitable for sharing with younger children, but 6 -8 year olds will especially delight in the word play and humor.

***Sky Boys: How They Built the Empire State Building*** by Deborah Hopkinson and James E. Ransome, Dragonfly Books, 2012

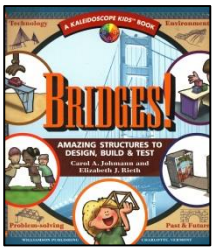



Set during the Great Depression, the story of the Empire State Building is told, poetically, by a young boy who watches the construction from start to finish. Beautifully illustrated historical fiction!

***A Year at a Construction Site*** by Nicholas Harris, Millbrook Press, 2009

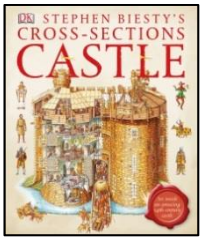
Get a bird's eye view of a construction site from groundbreaking to finishing touches as workers build a new school. Detailed illustrations provide lots to see, with something special to spot in each spread.

## Books for Schoolagers, 4th grade & beyond




***Bridges: Amazing Structures to Design, Build, and Test*** by Carol A. Jomann and Elizabeth Reith, Williamson Pub, 1999

This activity-filled book will inspire youth to construct in purposeful ways with construction paper, popsicle sticks, cereal boxes, and other easily accessible materials. It's suitable for independent use by older schoolagers, or for facilitated use with younger schoolagers. Look for the companion book about skyscrapers, too.

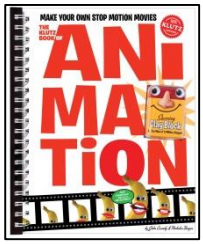



***Building Big*** by David Macauley, HMH Books for Young Readers, 2004

This factual book focuses on design and problem-solving related to making skyscrapers taller, bridges longer, and tunnels stronger.

***Castle Cross-Sections*** by Stephen Beisty, DK Children, 2013

Explore layer upon layer of castle life in this carefully crafted book. The high-interest illustrations make this a great pick for reluctant readers, but they may be surprised how much they've learned by the time they close the cover. Educators with mixed-age groups should note that castle defense is discussed in detail; some content may not be suitable for younger children.

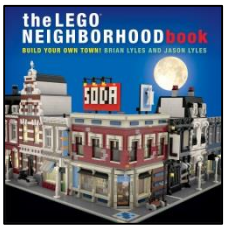



***The Klutz Book of Animation: Make Your Own Stop Motion Movies*** by John Cassidy and Nicholas Berger, Klutz, 2010

This book takes kids through each step of creating their own stop-motion production: crafting characters from polymer clay, drafting storyboards, filming frame-by-frame, and editing. Consider starting an claymation club in your schoolage youth program today!

***A City Through Time*** by Phillip Steele, DK Children, 2013

Follow the growth of a city over the course of hundreds of years as it changes from Greek colony, to medieval city, to modern metropolis.

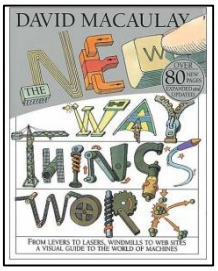



***The Future Architect's Handbook*** by Barbara Beck, Schiffer Publishing, Ltd, 2014

A fantastic introduction to site plans, floor plans, scale, and elevation; this appealing guide gives kids some genuine architectural know-how.

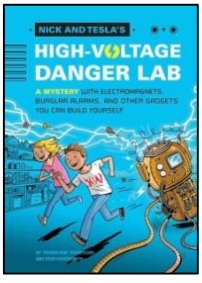
***The LEGO Neighborhood Book: Build Your Own Town!*** by Brian Lyles and Jason Lyles, No Starch Press, 2014

This isn't the first graders' Lego book! Learn about design elements like cornices and facades while tackling the very ambitious project of using Lego bricks to create a complex replica of hometown buildings. With enough bricks, space, and time, this book could inspire youth builders to work collaboratively for weeks on end.



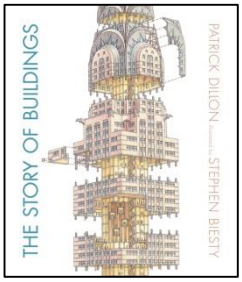

***The New Way Things Work*** by David Macauley, HMH Books for Young Readers, 1998

How does an email get from your computer to a friend's inbox? How does an electric guitar produce sound? How does your car's airbag know when to deploy? With fascinating illustrations and humorous but fact-filled text, this book explains dozens of mechanical concepts. Some entries – such as the camcorder and wired computer mouse – may feel a bit dated to today's youth, but there's a still lot to learn!




***Nick and Tesla's High-Voltage Danger Lab: A Mystery with Electromagnets, Burglar Alarms, and Other Gadgets You Can Build Yourself*** by Bob Pflugfelder and Steve Hockensmith, Quirk Books, 2013

11-year-twins use science, technology, and engineering to solve mysteries and save the day in this action-filled story. Includes blueprints and instructions for projects that readers can make using household materials.




***The Story of Buildings: From the Pyramids to the Sydney Opera House and Beyond*** by Patrick Dillon, Candlewick, 2014

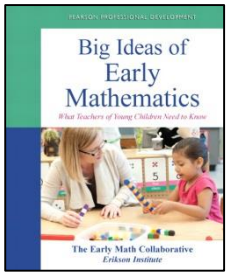
When, why, and how did people first begin to make buildings? How have design and construction changed throughout history? Incredibly detailed illustrations tell the stories of the Pyramid of Djoser, the Crystal Palace, the Taj Mahal, and more.

## For Teachers, Mentors, Parents, and other Important Adults


***Being with Babies: Understanding and Responding to the Infants in Your Care*** by Beverly Kovach & Denise Da Ros-Voseles, Gryphon House, 2008

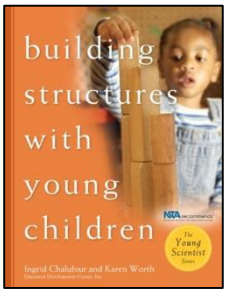
This book helps caregivers recognize the rapidly changing developmental stages of infants. Learn strategies to create an environment that encourages exploration and ways to respond to babies as they interact with the world around them.

***Big Ideas of Early Mathematics: What Teachers of Young Children Need to Know*** by The Early Math Collaborative, Erikson Institute, Pearson, 2013




Early math competence is one of the best predictors of school success, but this valuable skill set is much more complex than rote counting, tracing numbers, or pointing to shapes. This book illuminates the development of math skills in early childhood and explores ways to facilitate meaningful math learning. It's an ideal resource for adults as they make the most of children's opportunities to explore math concepts in the block and fine motor construction areas.

***Blocks and Beyond: Strengthening Early Math and Science Skills Through Spatial Learning*** by Mary Jo Pollman, Paul H Brookes Pub Co, 2010




What is spatial literacy, and why is it so important for success in school and life? This research-based book offers easy-to-use activities to meet the needs of learners in preschool through third grade.

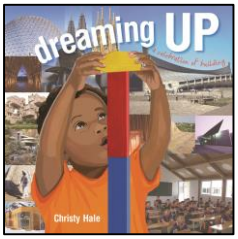
***Building Structures with Young Children*** by Ingrid Chalufour and Karen Worth, Redleaf Press, 2004

Discover ways to help children grow as structured thinkers and problem solvers as they construct with blocks. This book offers inquiry-based explorations of physics and engineering that incorporate naturally into children's play.

***Cultivating Outdoor Classrooms*** by Eric Nelson, Redleaf Press, 2012

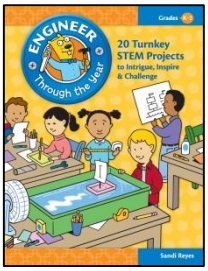
Outdoor classrooms offer many benefits for children, including ample space to construct on a larger scale and opportunities to interact extensively with sand and water in natural ways.

***Dreaming Up: A Celebration of Building*** by Christy Hale, Lee & Low Books, 1996




This poetic picture book pairs drawings of children at work with various construction materials with photos of architecture from around the world. Not only is it suitable for sharing with children, but it makes an inspirational addition to the teacher's own bookshelf as a reminder of each child's potential to change the world.

***Engineer Through the Year: 20 Turnkey STEM Projects to Intrigue, Inspire & Challenge*** by Sandi Reyes and Marianne Knowles, Crystal Springs Books, 2012

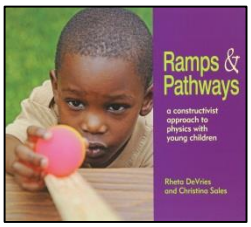



Unlike some STEM (Science, Technology, Engineering, Mathematics) books that require extensive equipment and/or specialized environments, this easy-to-use manual is well suited for a schoolage program where time and budget are limited. Learn to optimize opportunities for learning by encouraging kids to plan, problem solve, and reflect as they construct things like boats, kites, and drums. Intended for K-2, but many projects can be adapted for younger or older students.

***Making Makers: Kids, Tools, and the Future of Innovation*** by AnneMarie Thomas, Maker Media, Inc, 2014

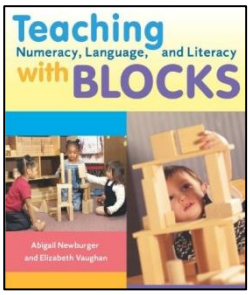
How is the ability to create and construct with one's own hands connected to learning and development? A reflective read for parents and teachers alike!

***Ramps and Pathways: A Constructivist Approach to Physics with Young Children*** by Christina Sales, National Association for the Education of Young Children, 2011




Explore how young learners construct knowledge as they experiment with wooden ramps, blocks, and marbles and consider ways to apply this "trial and error" approach throughout the classroom. Full-color photos of children's actual creations make this book especially appealing.

***Teaching Numeracy, Language, and Literacy with Blocks*** by Abigail Newburger and Elizabeth Vaughn, Redleaf Press, 2006




Blocks are one of the single, most valuable learning tools in the early childhood classroom. Learn to recognize development milestones and achievement of academic standards in children's "block work". A good resource for helping clarify why time, money, and floor space dedicated to the block area are a worthwhile investment!

*To enjoy this Arkansas Children's Week publication online and previous years', please visit www.asuchildhoodservices.org*

# Our Amazing Builders

Thank you to the following programs and professionals who submitted photos of children's construction projects for use in this book and in this year's Arkansas Children's Week workshop.

Their wonderful contributions to this project will help inspire builders everywhere!

Adventure Club
Bayyari Elementary Pre-K
Building Bridges
CAPCA Head Start, Beebe Center
CAPCA Head Start, Conway Center
CAPCA Head Start, Gould Center
CAPCA Head Start, Mills Center
CAPCA Head Start, Quitman Center
City and Country School
Gentry Early Learning Center
Greenbrier Westside ABC Preschool
Gunderman Family Home
Harris Family Home
Herlein Family Home
Infant Development Care and Nursery School
Kearney Family Home
Kiddie Kollege
Little Angels
The New School
Northside Koala Preschool
Rogers Activity Center
Rogers Public Schools Pre-K
Shining Stars
Sonora Middle School
Tennie Russell Primary School
The Children's Center of Otter Creek
WCC Bear Cub Pre-K