

# Arkansas Children's Week

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## Everyday Explorers

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## Welcome to Arkansas Children's Week 2020!

During this week, our state will celebrate you and the important work you do, while also highlighting the wonder, the joy and the unique needs of childhood.

As you prepare to support children as Everyday Explorers, try this quick self-check.

- How often am I able to slow down and see the world through a child's eyes?
- Do I recognize the moments of wonder that are all around me?
- In what ways do I honor and trust children's interests and ideas?
- How do I help children use their math and literacy skills in purposeful ways as they explore their interests?
- What opportunities do I have to support children's development and learning as they seek answers to their own questions?
- Does my space indoors and outdoors invite children to investigate and experiment?

With this book and in the Arkansas Children's Week workshops scheduled for March and early April 2020, you will be able to extend your knowledge and stretch your teaching skills. Together, we will become a little better at observing children and talking with them to expand their learning. We will explore ideas for encouraging math and literacy in authentic and meaningful ways. We'll think about how to plan projects and special experiences for children and connecting daily experiences with children learning goals and standards. And we'll have a lot of fun as we think and learn together!

**Welcome! We're glad you're here!**



# Everyday Explorers

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# Encouraging Infants as Explorers

## Face Time

A newborn infant's eyes are still developing at birth and it takes a while for the world to come into focus. During the first days outside the womb, she can only see clearly when things are very near her face. In the months that follow, she develops the ability to track movement and focus on things that are farther away. Very young infants are eager to find and study human faces. Face-to-face interactions with family and caregivers are a crucial part of her earliest exploration and she would rather look at a friendly human face than any toy.



When she seems awake and alert, lean in to make gentle, unhurried time for her to really see your face. How will she respond if you smile, make duck lips, coo, or stick out your tongue? Pay close attention to her cues. Linger as long as you can if she seems intently interested, but back off if she seems overwhelmed or tired.

Providing warm face-to-face interactions every day is an important step in nurturing infants and building trusting relationships with them.

## Black and White

In addition to being nearsighted, the newborn sees the world in shades of gray. Color vision develops gradually by the time she is 5 months of age. During the first 14 weeks after birth, some very young babies seem attracted to bold, black and white images. These bold images may be easier to see and interesting to think about.

Try showing baby books, pictures, and toys with high contrast images. Go slowly, letting her facial expressions and body language tell you if she is interested. She may focus intently and stare at a design that fascinates her for a minute or more. She may also express when she has had enough by looking away or becoming more agitated. That could be her way of telling you that her eyes are tired or that she would prefer to do something different.



## Mirror, Mirror

... on the wall, and on the floor, and in our hands! From birth, babies love to gaze at faces. Mirrors give them an “other baby” who will gaze back endlessly and respond to everything they do. Eventually, during toddlerhood, they come to recognize that the “other baby” is their own reflection! Mirrors also invite babies to notice light and movement, and to explore new perspectives of toys and their own bodies.

If you have a mirror in the sink area, try holding baby up to look together. Better yet, find large, unbreakable mirrors that can be mounted at baby’s eye level on the wall and smaller ones that can be carried around the room. Mirror exploration begins in early infancy and continues to be engaging throughout early childhood.



## Simple Squares

Renowned infant/toddler educator Magda Gerber described the ideal first plaything for infants as “a square of sturdy cotton or linen fabric, hemmed all around.” She suggests, “Arrange it to form a peak. Place it at an angle where the infant can look at it, reach out for it, touch it, and eventually grab it. You will be amazed at how many different ways and for how long even a young baby will manipulate it.” (Magda Gerber, *Educaring*, Spring 1986)

Many new baby toys have been developed in the past three decades, but none are better than a simple cloth square for first play experiences. Babies find them fascinating to clutch, wave, and chew on, while adults love that they’re soft and washable. Look for cotton napkins that measure 12-18 inches square, or sew your own. Provide direct supervision for young infants and avoid silky scarves, which are too easy to swallow.

In addition to being a perfect first plaything, mobile infants and young toddlers will explore many new ways to use the fabric squares as they grow. They make lovely doll blankets, props for dancing, and wraps for treasures. Or, tuck them into o-balls or baby wipe boxes to invite children to pull them out again.



## Let It Sway

As an infant’s vision develops, she becomes more adept at spotting things that are farther from her face. Objects hung from the ceiling offer something to focus on. Because they move in the breeze,

these objects promote visual tracking and spatial awareness. Traditional infant mobiles are one example of hanging display, but there's no reason to stop there. Try some of these, too:

- non-toxic hanging plants
- decorated/painted tree branches
- oversized, unbreakable Christmas ornaments
- strings of bunting flags
- decorative paper lanterns
- silk vine garlands with bird or butterfly ornaments



Hang items such as these where babies can easily see them while they're awake and alert. Try to provide a variety of interesting hanging items throughout the room, while also offering some uncluttered, blank spaces where the baby's eyes can rest. Outdoor displays can be created with weatherproof garden spinners, wind chimes, and strips of sheer fabric draped from trees or shade structures. Adding, changing, or rearranging hanging items from time to time will generate new interest. Long ribbons and strings should not be in reach of children except with direct, individualized supervision.

## **A Window to Our World**

Although there may be some times when you want to dim the light or protect infants from a bright glare, be sure that there are some times each day when you open your window shades to reveal the world outside. Natural light promotes vision development and babies are eager to see what is going on outside. Cars in a parking lot, rain falling in puddles, people passing by – there's so much out there to see and talk about together!

You can add even more interest by creating a mini-garden outside your window. Install a multi-armed garden post to hang songbird and hummingbird feeders, as well as baskets of flowering plants that will attract bees and butterflies. Place a shallow birdbath nearby. Additional possibilities include nesting boxes, flower boxes, and mirrored gazing balls. Consider inviting families to volunteer to help design a window garden, make hummingbird food, fill feeders, and/or tend plants. Working together to create a special nature space promotes family engagement and helps lighten the load of keeping feeders stocked and flowers watered.

## **Squirrel Buffet**

On a low, sturdy table or tray, try offering a medley of any of the following: grapes, plain Cheerios, pumpkin, apple wedges, acorns, watermelon chunks, squash, and sunflower seeds. Which treats will be most popular with your squirrels? Talk with babies about what and how the squirrels eat. Important note: To avoid choking risk, choose a feeding place that children can easily see, but not reach – outside the window or outside the fenced outdoor play area.

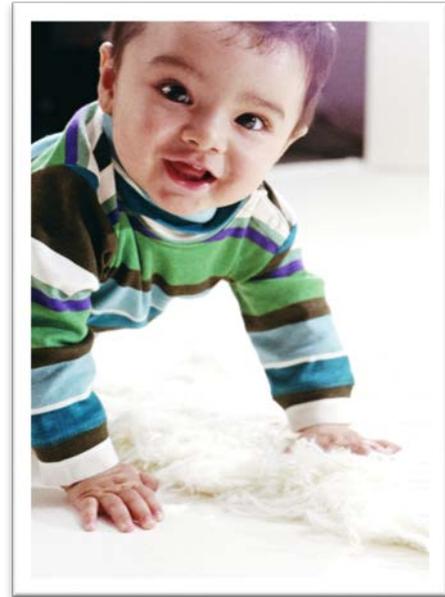


## Tactile Path

It's intriguing for infants to explore different textures. Collect a variety of large squares of material such as:

- Aluminum foil
- Bubble wrap
- Burlap
- Contact paper, sticky side up
- Corduroy fabric
- Fuzzy fleece
- Silky fabric

Use wide painter's tape to secure each piece to the floor, sealing completely along all four sides. Supervise closely and keep babies safe by removing any material that becomes torn or frayed. Notice how babies approach the new surfaces and investigate with their hands, feet, bodies, and even faces and mouths. What do they seem curious about?



You can also create a tactile path from a variety of clean, non-slip mats and rugs. Fluffy chenille rugs, rubbery bathtub mats, faux fur rugs, new (unused) pet beds, and bristly doormats are all interesting picks. Mobile infants will explore on hands and knees, while beginning walkers can explore with bare feet.

## Goodness from the Garden

Even before infants are ready to eat whole foods, they are fascinated by the texture, aroma, and mouth feel of real fruits and vegetables. With direct supervision, babies can safely investigate whole, unpeeled oranges, small pumpkins, and small melons. These can be washed before use and are generally sturdy enough to be handled and mouthed without breaking apart.

When infants are a little older, they can investigate soft foods like green peas, cooked carrots, and slices of banana and avocado. Plan edible experiences on a clean, sanitized table or tray and stay within arm's reach for safety. Provide ample time for mobile infants to touch, mash, move, and taste the fruits and veggies at their own pace. Don't worry about messy hands and faces – you can always clean up afterwards.



## Fill It Up

Offer mobile infants cardboard boxes – such as sturdy, empty diaper boxes - that they can fill with toys or climb inside. Filling things up can be a pleasing challenge, and very young children often seem compelled to climb into snug spaces.

How does their play change if you place a box on one side to create a cave-like space?

In addition to cardboard boxes, try some of these:

- large knit baskets
- laundry baskets
- shallow rubber tubs (Tubtrugs)
- sheet draped over a table to create a cozy space underneath
- tunnels
- wooden or heavy cardboard half rounds



“Our first box toy”

Flickr photo by pixydust8505, CC-BY 2.0



## Drop Boxes

Invite infants to explore by dropping objects into containers and then shaking them out again. Traditional shape sorters are one example of a drop box, but there are many other possibilities, as well. Try cutting a hole in a sealed shoebox or milk jug that is just the right size to fit ball pit balls through. Or, pair wide-mouthed jars with pop beads or soft blocks.

Drop boxes are most appealing to infants when they are well-matched to their baby’s emerging fine motor skills. Offer the simplest versions for younger infants and more complex ones for older infants and toddlers. Drop boxes with narrow opening – like the jugs pictured at left – are especially challenging.

“Hmmm – how did those curlers get in there?”

Flickr photo by C. Vindler, CC-BY 2.0

# Light, Shadows, and Things That Sparkle in the Sunshine

## Investigating with mobile infants, toddlers, and two-year-olds

How do you know when infants and toddlers want to study something? They'll show you! Take time to observe, noticing what draws their interest. When and where do they focus intently? When and where do they seem intrigued? Very young children are busy thinkers who are full of important questions – even if they don't have the words to ask them out loud yet! Recently, our mixed age group of mobile infants, toddlers, and twos showed us that they were especially interested in exploring shadows and light.

During outdoor play, we observed that the children often paused to investigate their shadows. While watching their shadows closely, they would experiment by waving their arms or stomping their feet. After a teacher used chalk to trace a shadow, the toddlers invented a game of “catching” their own shadows by dabbing a line of chalk on the sidewalk or fence.

Inspired by their interest, we all began to pay more and more attention to shadows as we went on walks and buggy rides. Together, we discovered the swaying shadows of trees on a breezy day, the zig-zag shadows of a railing along a set of stairs, and the crisscrossed mesh pattern of shadows beneath a picnic table. And of course we noticed our own shadows, which seemed to follow us everywhere. (Except on cloudy days, when we couldn't find any shadows at all.)



On sunny days, we experimented with turning off some of the bright overhead lights in our classroom. Our classroom has a low window – almost at floor level. Were we using it to its full potential? We began raising the shades more often to allow sunshine to stream through the window. When the room was lit with natural light, the children seemed better able to notice shadows.

We noticed that children began to gravitate to the window area during play. We wondered – What would happen if we placed objects on the floor in front of the windows? Would children notice and experiment with the shadows they cast? We began with a basket of sturdy plastic animals. The children soon found them and began lining them up along the windowsill. Their words and gestures told us that they had, indeed, noticed the animals' shadows on the floor. They would place or move an animal, then look pointedly at its shadow. We could see them thinking!



A spontaneous investigation occurred at the window when a child noticed the glittery print on her shirt sparkling in the sunlight. Children began to purposefully go to the window to examine themselves and their playthings in the sun. We wondered – What else could we offer for children to discover?

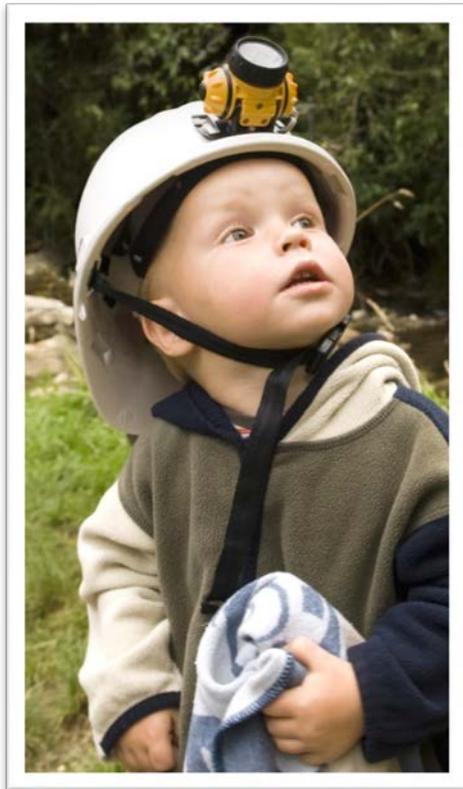
Each week, we placed something new near the window:

- Shiny, stainless steel mixing bowls that reflected like mirrors
- Colorful, translucent plastic blocks that looked like stained glass
- Sheer, sparkly fabric
- A basket of old CDs that reflected rainbows in the sunlight

Children responded to these invitations with great enthusiasm. We were amazed at how intently they focused on investigating objects in the sunlight. They lingered longer here than anywhere else in the classroom and seemed deeply engrossed in their play. A parent donated a beautiful, prismatic glass crystal that we hung high in the window. When the afternoon sun shined through it, rainbows danced around our room! The children spotted them right away. “Eh-bow! Eh-bow!” became their delighted call as they discovered rainbows on the walls, on the floor, and even on themselves.

When children welcomed us into their investigations by looking at us or showing us things, we narrated their experiences in a way that let them hear the words to describe what they were seeing and doing:

- “When you move the toy car, its shadow moves, too!”
- “You noticed the flashlight spot on the floor. You leaned down to touch it. How did it feel?”
- “You’re looking at your reflection in the mirror. There’s your own, smiling face.”
- “Would you like to help me turn off the light switch? It’s time to make our room dim so that we can rest.”



With careful supervision, we let the children explore sturdy flashlights. The children seemed especially captivated when a classmate shone a light through the holes of a colander, creating many smaller spots of light. They began to experiment with shining the lights into – and through – different objects around the room. Flashlights became so familiar and important to children that we noticed our toddlers incorporating pretend flashlights (cylinder blocks and toy cups) into their imaginative play.

We sought out other lights that children could carry around. We borrowed a helmet with a headlamp from the preschool classroom, and one of the families loaned us a lantern-style flashlight. We put a string of tiny, battery-operated “fairy lights” into a plastic jar that children could carry and roll, and we brought in a string of bigger lights encased in a clear, flexible tube.

The special lights seemed fascinating to children, but perhaps one of the most exciting discoveries of all came when a toddler discovered that she could peer through a cardboard paper towel tube. We think she found it interesting to see the bright world through a dark tunnel. The tube became so popular with children

– and so often quarreled over – that we quickly sent out a request to families and other classrooms. Save your cardboard tubes for us, please!

The children also began to show special interest in exploring light with colorful, translucent toys like color paddles, sensory balls, and plastic cups. They explored by shining lights through these objects, placing them in the sun, and peering through them to see the world in a new color. To further this investigation, we created a “sparkle garden” by hanging colorful, transparent sun catchers above the sidewalk.



### Homemade Sun Catchers

You'll need:

- Colorful, see-through, disposable plastic cups (#6 plastic)
- Baking sheet pans
- Parchment paper (a nonstick paper for baking, found near the aluminum foil at the supermarket)
- Spatula
- Oven
- Hole punch (optional)

Plan to work in a well-ventilated kitchen, away from children.

Line baking sheets with parchment paper. Place the cups upside down on baking sheets, about 2 inches apart. Place in a preheated 250-degree oven for 3-5 minutes, or until melted flat. Let cool.

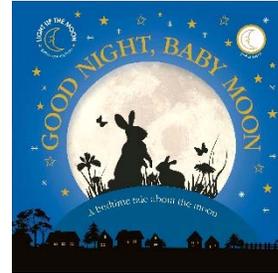
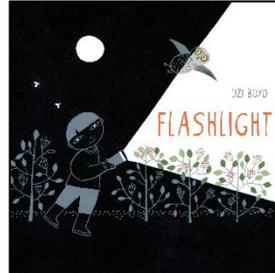
If you would like to make holes in the cups for stringing, use a holepunch along the mouth of the cup before baking.

It seemed like a natural next step to reflect children’s interest in light, dark, and things that shine and sparkle in our planned art experiences. As our teaching team searched online, we found lots of patterns for crafts like handprint sunshines and tissue paper rainbows. These were temptingly cute, but they didn’t help children investigate the things they seemed curious about. In the end, we skipped the crafts and decided on these open-ended art explorations, instead:

- White chalk on dark paper
- White and black paint, to be mixed freely into shades of shadowy gray
- With toddlers, sparkly holographic stickers to peel and stick
- With toddlers, easy-to-use craft hole punches that could be used to make holes in dark paper

We also wondered if our toddlers would be able to connect their firsthand experiences with books. Here are some favorites that we saved especially for one-on-one and small group sharing:

*Flashlight* by Lizi Boyd  
*Good Night, Baby Moon* by DK  
*Light Up the Stars* by Gabriele Clima  
*The Very Lonely Firefly* by Eric Carle



We knew they were making the connection when they ran to get flashlights to shine on the pages of the flashlight book! This was just one of the many times when our children seemed to borrow inspiration from one another, mimicking one another's behaviors as they tried out new ideas and play behaviors. Toddlers may not collaborate in the same way that older students do, but they definitely learn from one another!

Although other topics of interest eventually emerged through the year – often inspired by the changing seasons and events around our school – shadows, light, and things that sparkle in the sun continued to fascinate this group all year long! They returned to favorite play activities and investigations again and again, adding complexity over time. We teachers shared a smile each time we found new resources to add to our indoor and outdoor spaces, or ideas for new experiences that we could invite children to try.



Infants and toddlers are competent and capable learners. Their interactions with people, objects, and their world set the stage for all future learning and development. That's why it is so important for infant and toddler teachers to observe, plan, and reflect on experiences for discovery and learning – like the teachers in this story did.

The children in the story are part of a multi-age group. At the time that this project began, they ranged from 10 – 32 months in age. As you go back and read through the story again, consider when and how each of these Arkansas Child Development Early Learning Standards emerged:

## **Social Emotional Development**

### **SE1. Relationships with Others**

- ❑ SE1.1 – Forms trusting relationships with nurturing adults:  
Engages in back-and-forth interactions with familiar adults. (birth – 18 months)

Participates in longer back-and-forth interactions with adults to share experiences; imitates adults' actions; communicates ideas; seeks assistance; and engages in role play, games, or other activities. (19-36 m)

Explores the environment while regularly checking in with trusted adults. (9 – 36 m)

*Teacher's note:*

*Relationships are at the heart of everything we do with infants and toddlers. Our shared focus on shadows and light helped our teaching team slow down to really notice what children were interested in. Children welcomed us to share their exploration by pointing to things that interested them, bringing things to show us, and telling us about what they had found. There were lots of smiles and happy moments when we mirrored their enthusiasm for their discoveries!*

- ❑ SE1.2 Interacts with peers:  
Participates in associative play (playing independently but engaging in the same activity as other children, sometimes interacting through talking or sharing toys). (19 – 36 m)

*Teacher's note:*

*The older children in our mixed-age group are beginning to interact with one another more. They haven't exactly learned how to work together yet, but once one child has a brilliant idea, others take notice and join in the fun. Once one toddler figured out that she could lie on her back to shine a flashlight onto the ceiling, they were all on their backs with flashlights!*



## Cognitive Development

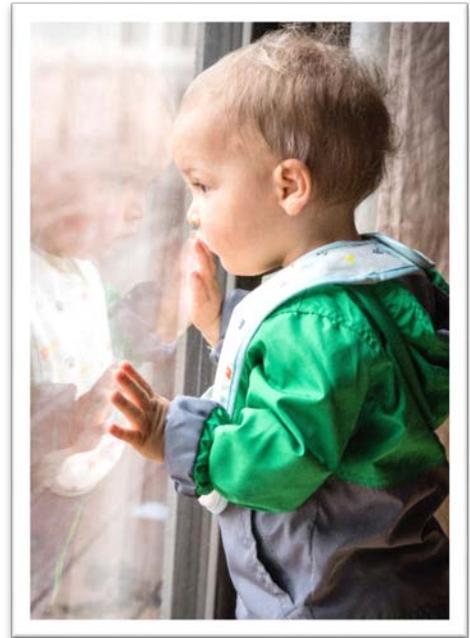
### CD1. Approaches to Learning

- ❑ CD1.1 Shows curiosity and willingness to try new things:  
Explores different ways to use objects or materials, investigates ways to make something happen... (9 – 36 m)

Asks increasingly complex questions beginning with basic “wh-” questions related to the immediate world around them... (19 – 36 m)

Shows pleasure or engagement when interesting or new things happen. (birth – 18 m)

Demonstrates interest in exploring new experiences or materials with increasing willingness to participate in new activities or experiences, even if the child perceives them as challenging. (19 – 36 m)



#### Teacher's note:

I once participated in a workshop where the facilitator reminded us, "They're new here." It's a simple statement, but so true. This investigation was filled with materials that were familiar to us, but fascinating to infants and toddlers - like rope lights, mirrors, and sparkly fabric.

When we made these things available to the children, they responded with great curiosity. We could see their minds at work as they tried using their materials in many different ways. Every time we added something new - or arranged familiar things in a new way - they set to work figuring out everything they could do.

- ❑ CD1.2 Shows persistence in approaching tasks:  
Repeats actions to produce similar results. (birth – 18 m)

Practices an activity many times with increasing independence to learn new skills and build mastery. (19 – 36 m)

Persists in activities for longer periods of time. (19 – 36 m)

#### Teacher's note:

Light and shadows absolutely captivated our group's attention. For example, Olivia (11 months) sat on the floor by the window for almost 20 minutes, quietly experimenting with a set of shiny, metal mixing bowls. She slid the bowls in and out of the sun, patted them, leaned in close to look at her reflection, and arranged them carefully along the windowsill.

Our teaching team was challenged to think about how our choices help or hinder children. We didn't want to distract Olivia or disrupt her thinking. We wanted to protect her workspace as much as we could, while also making sure that the other children had room to explore. Noticing children's investigations made us much more aware of the right (and wrong) times to ask children questions, pick them up for diaper changes, and so on.

## CD2. Executive Function

### CD2.1 Focuses and sustains attention:

Orients to and focuses on sounds, activities, people, and objects in the environment. (birth – 18 m)

Shows increasing ability to attend to people and objects and join others in a common focus. (birth – 18 m)

Focuses on something specific while ignoring irrelevant information with increasing skill. (19 – 36 m)

### CD2.2 Shows flexibility in adjusting thinking and behavior in different contexts:

Uses familiar objects in new and unanticipated ways. (birth – 36 m)

*Teacher's note:*

We found that we would set out materials thinking, "This is how children will use them." - and they surprised us every single time. Infants and toddlers are clever, inventive little people!

### CD2.4 Holds and manipulates information in memory:

Responds to familiar people and objects. (birth – 18 m)

Remembers and communicates about recent events. (19 – 48 m)

*Teacher's note:*

When children gathered materials and made a beeline for the sunny window area, we knew that they were remembering their recent investigations there. There were other clues that children were remembering, too. When we went outside on a cloudy day, one of our two-year-olds turned in a circle, looking over his own shoulder to try to find a shadow. He seemed so confused as he asked, "Where'd I go?" When we went outside that afternoon, the sunshine had returned. He spotted his shadow right away, laughed, and exclaimed, "I'm back!"

## CD3. Logic and Reasoning

### CD3.1 Uses reasoning and planning ahead to solve problems and reach goals:

Uses own movements and actions to solve simple problems or reach goals. (birth – 18 m)

Uses a variety of strategies to solve problems such as trial-and-error, applying knowledge from previous experience, asking for help, or using objects as tools. (9 – 60 m)

Teacher's note:

We noticed that children used problem solving strategies as they explored new flashlights and lanterns. They searched for power switches, and, when they found something that looked like a switch, they tried sliding it or mashing it. If they couldn't get a light to work, they would bring it to one of us. One child asked, "On, please!" They even showed that they knew that a light that wouldn't work might need new batteries.

CD3.2 Engages in symbolic and abstract thinking:

Recognizes that illustrations and photographs are representations of real things. (9 – 36 m)

Uses familiar objects to represent something else and acts out routines, stories, or social roles alone or with peers. (19 – 48 m)

Teacher's note:

We wondered whether our toddlers would recognize themes of light and shadows in books, and they showed us that they did. This was especially evident when they gathered their own flashlights to look at our book about a child with a flashlight. They also identified shadows in photographs, leaning in to take a closer look.

One day, we noticed two toddlers peering into our playground playhouse with empty bubble bottles in their hands. We asked each other, "What are they doing?" Then we realized: they were pretending to look into the playhouse with flashlights! When real flashlights weren't available - and sometimes even when they were - our toddlers used blocks, cups, and other toys as pretend lights.

## Physical Development and Health

### PH1. Gross Motor

PH1.1 Demonstrates locomotor skills:

Moves from crawling to cruising to walking showing increasing coordination for each skill. (9 – 18 m)

Changes speed or direction while moving though may have difficulty stopping with control. (19 – 36m)

PH1.2 Shows stability and balance:  
Sits independently with increasing stability and ability to change positions (e.g., get into sitting position from lying down or crawling, reach for a toy without falling, pull to a standing position from sitting). (birth – 18 m)

Shows increased ability to maintain balance while in motion when moving from one position to another, changing directions, or stopping abruptly. (9 – 48 m)



Teacher's note:

We don't use exersaucers or seats with our babies because we want them to have freedom to explore. I guess you could say that we want our mobile infants to be as mobile as possible! Getting rid of big seats freed up a lot of floor space, but there's still the question of what motivates children to move around the room. As we investigated shadows and light alongside children, we found that the materials we added to the room naturally encouraged children to move closer, shift to change perspective, and carry things around.

PH1.3 Demonstrates gross-motor manipulative skills:

Reaches for and drops objects, grasps a rolled ball or other object with two hands, pushes or rolls objects, bats or swipes at toys. (birth – 18 m)

PH2. Fine Motor

PH2.1 Demonstrates fine motor strength, control, and coordination:

Uses hand-eye coordination to reach for, touch, and explore properties of objects. (birth – 18 m)

Uses hand-eye coordination to complete tasks, though may lack precision in some actions. (19 – 36 m)

Teacher's note:

One thing that we discovered about our open-ended materials was that children of different ages could use them in different ways. Our room is always a busy place. At one point, I looked around the room and saw all of these play behaviors going on at once:

- Mobile infant tugging on pieces of sparkly fabric, pulling them out of a basket
- Young toddler banging two rainbow blocks together
- Toddler carefully touching each (covered) bulb in a string of rope lights
- Toddler sliding old CDs around on the sunny floor by the window
- Two-year-old stacking rainbow blocks on the window sill

## Language Development

### LD1. Receptive Language

LD1.1 Understands and responds to language:

Attends to familiar objects...and understands the meaning of an increasing number of simple words, especially objects encountered in everyday life. (9 – 18 m)

### LD2. Expressive Language

LD2.1 Uses increasingly complex vocabulary, grammar, and sentence structure:

Begins to say a number of simple words. (9 – 18 m)

Begins to use two- and three- syllable words and names specific people, animals, and things. (19 – 36 m)



LD2.1 Uses increasingly complex vocabulary, grammar, and sentence structure, continued:

May combine two words to express and want or interest. (9 – 18 m)

Increasingly combines simple words into sentence-like structures. (19 – 36 m)

Teacher's note:

Our children learned to use lots of new words during this investigation, including "flashlight", "rainbow", "sparkle", and "shadow". Even the ones who were too little to say the words (yet) showed us that they understood in other ways.

### LD3. Communications Skills

- ❑ LD 3.1 Communicates using social and conversational rules:

Initiates interaction or “conversation” with adults by pointing at objects, speaking or signing a word, sharing a toy, or calling attention to an object or person. (9 – 18 m)

Engages in brief back-and-forth conversations, often imitating words, tone, and actions of adults. (19 – 36 m)

Shows joint attention by shifting gaze to where an adult is looking or gesturing. (9 – 18 m)

### Emergent Literacy

#### EL1. Engagement in Literacy Experiences and Understanding of Stories and Books

- ❑ EL1.1 Shows interest in literacy experiences:

Participates in and actively seeks out a variety of literacy experiences... (19 – 60 m)

- ❑ EL1.2 Engages in read-alouds and conversations about books and stories:

Actively participates in book reading experiences by pointing to pictures, turning pages, and making sounds or simple comments. (9 – 36 m)

Shows comprehension by making comments, asking and answering questions, and responding to prompts during book reading experiences. (19 – 48 m)

Pretends to read, describing what is happening and using some language from the book with pictures as cues. (19 – 60 m)

Teacher's note:

We've always had books in our classroom, but we became more intentional about the books we chose to share with children. We found some books that were especially about shadows or light, and we also became more aware of ways to connect children's other favorite books to our topic. There are great shadows in Goodnight Gorilla. The golden sun shines through the window at the end of The Napping House. "Lap shares" with books were times to point to and talk about the very same things that children were exploring around the classroom and outdoors.



### EL3. Knowledge and Use of Books, Print, and Letters

#### EL3.3 Demonstrates emergent writing skills:

Explores writing tools and movements, making scribble marks with increasing control. (9 – 36 m)

Teacher's note:

Sidewalk chalk had been accessible - with close supervision - on our playground for a while, but children's interest in it really took off when one of the teachers traced a child's shadow. Several of our older children ran around putting chalk marks on every shadow they could find!

### Mathematical Thinking

#### MT1. Number Concepts and Operations

#### MT1.1 Demonstrates number sense and an understanding of quantity:

Shows early one-to-one correspondence when supported by context. (9 – 18 m)

#### MT1.2 Explores combining and separating groups (numerical operations):

With increasing independence creates larger and smaller groups of objects... (9 – 36 m)

Teacher's note:

Our infants and toddlers often played with materials by piling them up and carrying them around. They each seemed to have their own purpose to their work: this one might collect all of the pieces of shiny fabric from around the room, while that one gathers CDs in a bucket. One-to-one correspondence was observed when children placed one toy in each square floor tile, one ball in each bowl, or one even one flashlight in each fist.

## MT2. Algebraic Thinking

- ❑ MT2.1 Uses classification and patterning skills:

Explores the characteristics of objects through various means... (birth – 18 m)

Repeats certain action sequences intuitively... (9 – 36 m)

Teacher's note:

The youngest children in our mixed-age group may not explore in the same ways as the toddlers, but they are just as busy learning about their world. Their investigations usually involve shaking, banging, mouthing, dumping out, and tossing things. These aren't misbehaviors - they're discovery behaviors! If we have to redirect to keep things safe, we find other materials that they can explore the way they want to.

## MT3. Measurement and Comparison

- ❑ MT3.1 Participates in exploratory measurement activities and compares objects:

Investigates properties of objects and materials through exploration and play; later in this age range labels some attributes of objects. (9 – 36 m)

Uses descriptive words or signs of increasing complexity including “big”, “little”, “hot”, “cold” and makes simple comparisons. (9 – 36 m)

Teacher's note:

Some of the questions that our children seem to try to answer:

- Will it fit in my bag/box/bucket/pocket?
- Can it go from here to there?
- How many can I carry?
- Can I get on it, in it, or under it?

As they experiment, they think about concepts like "big", "little", and "tall". We helped give them the words for their discoveries by talking about what we see them doing. Pretty soon they're saying the words, too.

During our shadows and light investigation, we noticed toddlers experimenting with things that become hot in the sun. They would touch something and pull their hand back, exclaiming, "Ouch!" - sometimes because the object really was warm to the touch, and sometimes because they were just pretending that it was.

## Science and Technology

### ST1. Scientific Practices

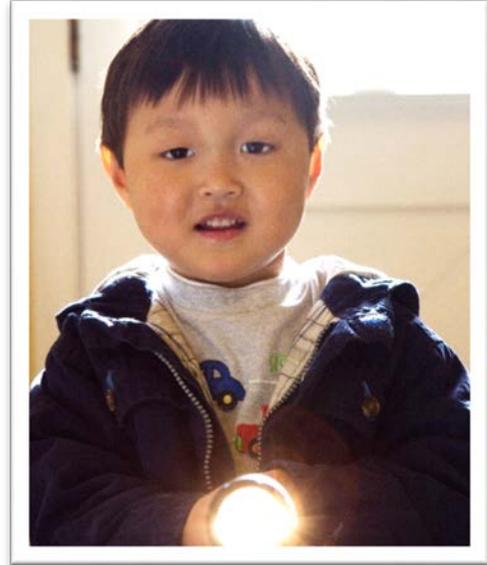
- ❑ ST1.1 Engages in scientific process to collect, analyze, and communicate information:

Explores and manipulates objects using multiple senses. (birth – 18 m)

- ❑ ST1.1 Engages in scientific process to collect, analyze, and communicate information, continued: Asks questions, makes observations, and predictions about the world around them with adult support. (19 – 48 m)

Recognizes ability to make things happen and intentionally repeats actions to observe their reaction. (birth – 18 m)

Explores cause-and-effect relationships by varying actions to change the reaction. (19 – 48 m)



## ST2. Knowledge of Science Concepts

- ❑ ST2.1 Demonstrates knowledge of core science ideas and concepts:

Shows beginning awareness of parts of own body and how to use them to interact with the world in specific ways. (birth – 18 m)

Describes changes in the environment with adult support. (19 – 48 m)

### Teacher's note:

*Our toddlers began to recognize that there were sunny days with shadows, and cloudy days without. Sometime we experienced clouds and sun in the same outdoor time. One of our two-year-olds also began to describe how shadows change size and shape during the day. She'll learn more about the sun's position in the sky as she gets older. For right now, we're delighted to see that our children are such keen observers of their world!*

## ST3. Knowledge of Science Content

- ❑ ST3.1 Demonstrates knowledge of characteristics of living things, the earth's environments, and physical objects and materials:

Actively explores and experiments with physical properties of objects and materials. (birth – 36 m)

- ❑ ST3.2 Uses tools and engineering practices to explore and solve problems:

Uses own body, other people, or objects to make something happen. (9 – 36 m)

### Teacher's note:

*We make a conscious effort not to interfere when infants and toddlers are struggling to figure something out. When an infant tries to reach a toy that has rolled under the table or a toddler's block tower keeps tumbling down, it's tempting to come to the rescue. But as long as they are safe, there's value in letting them work it out. They may repeat a pattern of movements over and over or try out different ideas. They're learning through repetition and trial and error. Even babies show that they can analyze a situation, learn from unsuccessful attempts, and try out different strategies to get what they want!*

## Social Studies

### SS2. History and Geography

- ❑ SS2.1 Shows awareness of sequence and change over time:  
Understands...increasingly complex time-related words and concepts. (19 – 60 m)
  
- ❑ SS2.2 Demonstrates simple geographic knowledge:  
Knows where some favorite toys or foods are stored in familiar places. (9 – 36 m)
  
- Understands and uses words indicating relative distances (e.g., near, far, close). (19 – 60 m)

## Creativity and Aesthetics

### CA2. Visual Arts

- ❑ Explores, manipulates, creates, and responds to a variety of art media:  
Participates in child-initiated visual art activities and with adult support experiments with a variety of media and materials. (9 – 36 m)



#### Teacher's note:

As long as we let them, children experiment every time they use art materials. Here are some of the things they seemed to concentrate on during our shadows and light investigation:

- Chalk - Pressing lightly and pressing hard, making dots and long strokes, smearing the chalk lines with their fingers
- Paint - Spreading paint across the page, swirling colors of paint together, patting the paint, making marks with paint and marks in wet paint with brushes, palms, finger tips, fingernails
- Stickers - Peeling and positioning stickers, trying to remove stickers from paper, sticking stickers on their hands, stacking/overlapping stickers on the page
- Hole punches - Pressing with one hand or both hands together, listening to the sound of the hole punch, peering through the holes in the paper, tearing and crumpling paper

Families are sometimes eager for their toddlers to "really make something" - meaning they're eager for representational drawing to begin. We help them see that this early phase of art is stunningly important for their child's creative and cognitive development

# Exploration Happens Here

## Eight Ingredients for Child-Led Learning

“Children’s learning happens through the active, playful exploration of their environment and participation in meaningful interactions with others. Children’s learning in early childhood happens in an integrated way throughout the day.” (Arkansas CDELS, 2016.)

Have you ever wondered whether the materials and play spaces truly invite children to explore? On the pages that follow, you’ll find a set of “ingredients” that can come together to create wondrous places for children. When we welcome children into environments like these, we encourage and empower them to follow their own interests as playful investigators.

In this article, examples of materials are generally arranged from simple to complex. In other words, materials that are suited for younger children are listed first in each section, followed by those that provide challenge for older preschoolers and schoolagers. However, many materials can be adapted to support children of various ages.

This article also encourages you to reflect on your own practices and seek out new inspiration from your favorite sources. There are places throughout to record your thoughts and ideas. Consider taking the article with you as you tour other programs – in real life or virtually, through inspiring blogs and Pinterest pages. Together, we can create spaces that invite, enhance, and extend children’s discoveries.

### **1. Things that children can move and change.**

Moveable materials encourage experimentation and invite children to explore cause and effect. Children begin to figure out the amount of force needed to making something move, change directions, or stop. Problem solving emerges as children test out new ideas.

Things that children can move and change include:

- Balls or cars with ramps
- Different colors of playdough or paint that can be mixed together freely
- Water or sand with chutes and tubes
- Simple, safe catapults for balls or beanbags
- Pendulums and pulleys

The best materials for moving and changing are kid-powered (not battery operated), and offer children many choices within their play. When materials can be combined and adjusted in many different ways, children have opportunities to try out different strategies and make changes to achieve different results.

**Look closely at the space you share with children.  
Where and how are children invited to experiment by moving and changing things?  
What else might spark their curiosity?**

We currently have:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____



## **2. Things that children can put together and/or take apart.**

As children construct and deconstruct, they plan and make decisions about what should happen first, next, and last. Their work is often goal-driven and takes time to carry out. They decide when they are satisfied with their work and feel finished. In the process, they have many opportunities to explore balance, symmetry, and structural design.

Things that children can put together and take apart include:

- Containers that can be freely emptied and filled
- Building blocks
- Clay
- Interlocking building materials such as Duplo, Tinker Toy, and K'nex
- Recycled materials such as cardboard tubes, jar lids, and wood scraps with tape and glue for joining. Woodworking and sewing tools can also be introduced as children are ready.
- Old, non-working electronic items – such as radios or toasters – that children can take apart with screwdrivers and other tools

When choosing materials for putting together and taking apart, limit or eliminate instruction booklets that give step-by-step directions for a finished product. Instead, encourage children to think about and carry out their own designs.

**Look closely at the space you share with children.**

**Where and how are children invited to construct (put together) and deconstruct (take apart)?**

**What else might you add?**

We currently have:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____



### **3. Things that children can compare, sort, and arrange.**

Collections of materials invite children to explore by handling objects, noticing their likenesses, grouping them, lining them out, and more. Children seem especially intrigued when collections of materials share some common elements, but also have some differences.

Things that children can sort and arrange include:

- Collections of items that range in size, such as nesting cups, graduated hat boxes, or nuts and bolts of different sizes
- Collections of items that are the same size, but different in other ways – such as bangle bracelets made of rubbery silicone, smooth wood, and shiny metal
- Pattern blocks, pegs with peg boards
- Paint color swatches from a hardware store

Notice all of the different ways that children use these materials. One child might pick through a tin of buttons to gather a handful of the blue ones, while another child carefully piles all of the translucent buttons together. A third child might line out a series of buttons from smallest to largest. Each child is busy making sense of the materials in their own way.

**Look closely at the space you share with children.**

**Where and how are children invited to compare, sort, and arrange materials?**

**What other collections of items might fascinate them?**

We currently have:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____



#### **4. Open-ended things that children can use in their own, creative ways.**

Most toys that come from the store already “are” something: a truck, a doll, a dinosaur. Open-ended materials are different. They are simple things that can be repurposed freely to serve any role that children can think up.

Open-ended materials include:

- Play silks and scarves
- Milk crates, laundry baskets and cardboard boxes
- Traffic cones and manufacturing spools
- Tarps, blankets, lengths of tulle fabric
- Collections of smaller loose parts, such as pebbles, driftwood chips, and craft sticks

For more loose part ideas, see the list on the following page.

# The Ultimate Loose Parts List

For infants, toddlers, and beginners, try:	For more experienced preschoolers, add:	For oldest and most experienced preschoolers & schoolagers, add:
<p>Bangle bracelets Cardboard boxes Cardboard packing tubes Child-sized traffic cones Cloth squares, cloth napkins Coasters Detergent caps and scoops Dryer balls Large hair rollers Large jar lids Large spools Large, smooth-sanded “tree cookies” Lidded boxes and tins Lids from oatmeal and coffee canisters Milk crates Napkin rings Old CDs Silicone muffin cups Small bowls Small laundry baskets Stainless steel condiment cups Wooden rings Yogurt cups</p>	<p>Acorns, buckeyes Bingo chips Bird bagels Bottle caps Buttons Checkers and chess pieces Citiblocs, Kapla planks Corks Craft sticks, clothespins Doilies Fabric swatches Felted wool balls Game chips Golf tees Jingle bells Large beads Lollipop sticks Marker caps Milk caps Neon plastic 2 oz. glasses Oversized sequins Paint, tile, and wallpaper samples Pegs Pencil grips Play silks Playdough canister lids Pompoms Rattan wicker balls (vase filler) River rocks Small jar lids Small spools Small “tree cookies”</p>	<p>Aquarium gems Battery-operated tea light candles Cocktail stirrers and coffee stirrers Driftwood Flat glass floral marbles Foil sheets Game pieces with numbers and letters Glass mosaic tiles Gutter, tubing, and PVC pipe pieces Metal washers Miniature bricks Mirrored tiles Nuts and bolts Perler beads Rolls of tulle, ribbon, yarn with scissors Rubber bands Small beads Small nuts and bolts Spools of fine wire with wire cutters Tires, full-sized traffic cones (outdoors) Twigs Twist ties Wood planks</p>

Adapted from the Arkansas State University Childhood Services workshop, AIM for Best Practices: Getting Started with Loose Parts (2019)



Loose parts and other open-ended play objects can be incorporated into most play areas, including block building areas, dramatic play areas, and sand/water play areas. Notice how children employ them in their imaginative play and as components for construction and experimentation.

**Look closely at the space you share with children.**

**Where and how are children encouraged to use open-ended materials in creative ways?**

**What additional materials might you add?**

We currently have:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____



## 5. Tools for looking closely, measuring, and grouping.

Tools give children the power to gather information about their world. Some tools make it easy to see tiny details, while other tools make it possible to compare weight, size, and quantity.

Tools include:

- Unbreakable mirrors
- Flashlights
- Rulers and tape measures
- Scales, including balance scales, bucket scales, and bathroom scales
- Sorting trays and graphing grids
- Magnifying lenses, binoculars, microscopes



Although children can figure out the simplest tools – like mirrors – on their own, they need adult support to use more complex tools. To boost purposeful use, introduce each new tool to children. Demonstrate how it is used and explain how to handle it carefully. Because work habits take time to form, plan to model and remind children about tool use throughout the year as you seek natural opportunities to invite children to use them as a part of their investigative play.

Pictured above: Learning Resources Zoomy Handheld Microscope  
 Inexpensive digital tools like this one transform any computer into a simple microscope.

**Look closely at the space you share with children.  
 Where and how are children invited to use tools to gather information about their world?  
 What other tools could support their exploration and thinking?**

We currently have:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____

## 6. Opportunities to communicate through creative arts.

The arts include visual arts, dance, music, and drama, which begins with children’s dramatic (pretend) play. Through dramatic play, children recreate familiar experiences and imagine new possibilities. This is how children work through their ideas and try out the language and concepts of the world around them. Their interests and impressions are made evident by the roles they choose and the scenarios they carry out. Likewise, visual arts offer meaningful ways for children to explore, express, and share their important ideas.

Materials to support communication through the arts include:

- Authentic and homemade dramatic play props related to real-life experiences
- Puppets and props related to familiar stories
- A variety of drawing materials and paints with large sheets of blank paper
- Clay or play dough for model making

Children thrive when they have the power to make choices about their own work and play. Adults provide invitations for experiences that may interest children, but remain flexible, following the children’s lead when different ideas emerge. Consider the joy and wonder of each of these unexpected surprises:

- A teacher gathers a collection of restaurant props for her group of 2-year-olds. She places menus, dishes, chef’s hat and apron, and a cash register in their dramatic play area. Rather than playing a restaurant game, several children pretend to be puppies and kittens eating out of bowls under the table. One child curls up in a nest-like pet bed made from one of the aprons.
- In the pre-k room, a teacher offers large sheets of blue paper alongside an assortment of white paper scraps, tinsel bits, cotton balls, glitter glue, and shiny silver sequins. She tells children, “Perhaps you would like to make a collage inspired by our recent snowy weather.” While several children make snowy scenes, 5-year-old Elijah create a paper robot. He works intently to paint the entire robot in silver glitter glue before adding a sequined control panel.
- The 3<sup>rd</sup> and 4<sup>th</sup> grade afterschool group has a tradition of reading a daily poem at the beginning of homework time. Their teacher, Mr. James, places the poem-a-day book in the reading nook where children can look at it quietly as they finish their homework. One day, one of the children begins to rap the rhyming words of the poem. This quickly catches the interest of several other children. They plan to take the poetry book outside to work together on a musical routine.

**Look closely at the space you share with children.**

**Where and how are children invited to communicate through creative arts?**

**What other ideas or opportunities could be considered?**

We currently have:

We might also try:

<hr/>	<hr/>



## 7. Purposeful, authentic photos and artifacts.

Never before has photography been so easily accessible to educators and students! Phones and tablet computers have built-in cameras, and sturdy video recorders and child-friendly digital cameras are affordable tools for children's use. In addition, high quality images can be found online at sites such as these:

### **Pics for Learning**

[www.Pics4Learning.com](http://www.Pics4Learning.com)

A site intended especially for educators. Photos are curated by topics – such as animals, foods, road signs, and weather – and are free to use for educational purposes. The site promises that all photos are child-friendly, however care should always be taken with user-contributed content.

### **Photos for Class**

[www.photosforclass.com](http://www.photosforclass.com)

A simple search engine for free, child-friendly images. Although the photo bank is limited, this site can be a terrific tool for modeling purposeful technology use. Adults can help children find photos to extend a discussion or answer a child's question. ("Ruby wants to know if moths have feathers on their wings. Would it help to look at some photographs of moths? You can type the word moth into the search engine – m-o-t-h.")

### **Unsplash**

[www.Unsplash.com](http://www.Unsplash.com)

Photographer's sharing site with free, high resolution stock photos to use for any project. Not all photos are suitable for young children, but adults can use this site away from the children to select photos to print for children's use.

Possibilities for using photos with children include:

- Mounted or framed photos of the children, their families, and people they know at school.
- Cards with photos of places children recognize in their communities.
- Group timeline with photos of children's recent experiences and special days.
- Homemade books documenting children's ongoing work with blocks, playdough, and loose parts.
- Interesting photos related to children's current topics of interest. These can be laminated or placed in page protectors to prevent wear and tear.

A toddler teacher took this collection of photos of her own dogs at home. She laminated the photos and put them out for children to examine, talk about, and carry around. The photos offer a safe way for toddlers to look closely at the dogs' eyes, nose, mouth and paws – things they seem especially curious about. This prompted recurrent, rich conversations about dog and human body parts and senses.



While photo collections are a powerful learning tool, artifact collections might be even better! Artifacts aren't toys or replicas; they're authentic, real life objects that children can handle and examine. Artifacts can be given a special place in the environment – such as their own, small table – where children have unhurried time to investigate them.

Examples of artifact collections are listed on the following page. Consider how families and community members might be able to contribute to collections such as these.

**Clothing and Accessory artifacts for toddlers** (check for choking hazards)

Bangle bracelets  
Clip-on hair bow  
Clip-on tie  
Hat  
Purse without long straps  
Shirt with securely-sewn buttons  
Shoes with laces, buckles, Velcro  
Sunglasses  
Vest  
Wallet with old plastic gift cards to insert and remove  
Wristwatch

**Forest/Nature Center artifacts**

Bark  
Bird nest (sanitized)  
Compass  
Field guide  
Pine cones  
Reflective hiking trail sign  
Topographic map  
Trays of soil, pine needles, moss, and/or leaves  
Tree stump

**Transportation artifacts**

Infant car seat with baby doll  
Keys on keychain  
Lug nuts  
Motorcycle helmet  
Road map  
Steering wheel  
Tire  
Tire pressure gauge  
Vehicle owner's manual or advertising brochure

**Construction artifacts**

Blueprints  
Brick  
Hard hat  
Level  
Lidded (empty) house paint can with opening key  
Light switch assembly  
Neon construction vest  
Paint roller  
Safety goggles and headphones  
Spool of electrical wire  
Tile or flooring samples  
Work gloves

**Gardening artifacts**

Clay flower pots and trays  
Deer/bird netting  
Gardener's kneeler  
Gardening gloves  
Seed packets  
Seedling tray  
Spade and trowel  
Water hose and nozzle  
Watering can

**Musical artifacts for schoolagers**

Drumsticks  
Guitar strings and pick  
Metronome  
Microphone  
Music stand  
Sheet music  
Tambourine  
Tuning fork  
Ukulele  
Woodwind reed

As they investigate artifacts, children notice size, weight, texture, sounds, and smells, as they explore features and functions. What does this do? How does that feel? How do these parts go together? It's easy for adults to forget how eager children can be to inspect and interact with real things!

Adults provide supervision and guidance to help children handle artifacts safely and gently. They also mirror children’s enthusiasm for artifacts, encouraging them to make observations, ask questions, and tell about their experiences.

**Look closely at the space you share with children.**

**Where and how are children invited to investigate photos and artifacts?**

**What else might you do?**

We currently have:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____



## 8. Books to enhance real-life investigation.

Most early childhood environments are filled with storybooks, but what about non-fiction (informational) books? Carefully chosen factual books empower children as researchers who can gain expertise and find answers to the questions that feel important to them.

When selecting informational books, consider:

- Will this topic appeal to this group of children?
- How does this topic connect to children’s firsthand experiences and investigations?
- Is the content of the book true, accurate, and age appropriate? Will it extend children’s knowledge?
- Are photos/illustrations large and easy to see?

Young children engage first, and most, with a book’s illustrations. Seek out books with high quality photos and realistic drawings. Think about what children can learn by studying each

book’s illustrations. Also check each book carefully to ensure that illustrations do not depict violence or images that may be frightening to children. On the next few pages, you’ll find a list of recommended informational books for each age group. Which are your favorites?

Informational books are usually best for sharing informally with individuals and small groups of children, rather than with larger groups. Avoid overly simple books intended for beginning readers. These often lack the rich vocabulary and specialized information that curious children seek. Instead, seek out interesting books that will genuinely intrigue your group. When reading together, you can shorten long and complicated text by selecting shorter excerpts that are most relevant to children’s interests.

**Look closely at the space you share with children.**

**Where can children find informational texts to answer their questions and support their first-hand experiences?**

**When and how do adults model and encourage book use?**

**What other ideas or opportunities could be considered?**

Currently, we:

We might also try:

_____	_____
_____	_____
_____	_____
_____	_____



**Putting it all together**

We support children as explorers by ensuring ample daily access to:

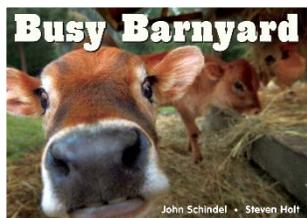
- |   |   |
|---|---|
| 1. Things to move and change                  | 5. Tools for investigation                      |
| 2. Things to put together and take apart      | 6. Opportunities for creative arts              |
| 3. Things to compare, sort, and arrange       | 7. Authentic photos and artifacts               |
| 4. Open-ended things to use in their own ways | 8. Informational books to support investigation |

# The Young Explorer's Bookshelf

## Informational Books to Support Children's Investigations

### Informational books for infants, toddlers, and twos

*Bloom, Boom* by April Pulley Sayre, Beach Lane Books, 2019  
Relates to children's experiences with plants, insects, and flowers



*Busy Barnyard* by John Schindel and Steven Holt, Tricycle Press, 2006  
Relates to toddler's experiences with familiar farm animals.

*Flutter, Fly* by Kaaren Pixton, Workman Publishing, 2009  
Relates to children's experiences with birds and flying insects.

*Mix It Up* by Herve Tullet, Chronicle Books, 2014  
Relates to toddler's experiences with color mixing and paint.

*Moving Blocks* by Yusuke Yonezu, minedition, 2015  
Relates to toddler's block building experiences.



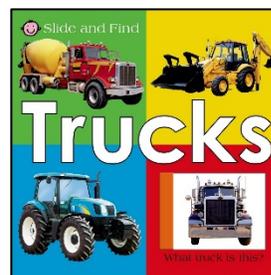
*My Neighborhood* by Maddie Frost, Workman Publishing, 2018  
Relates to children's experiences with familiar people, including community helpers.

*National Geographic Little Kids - Look and Learn Series* by National Geographic Children's Books, 2018  
Series of books relate to children's experiences with bugs, birds, pets, and more.

*Pop-Up Peekaboo: First Words* by DK, DK publishing, 2018  
Relates to children's experiences with familiar objects.

*Trucks: Slide and Find Series* by Roger Priddy, St. Martin's Publishing Group, 2007  
Relates to toddler's experiences with large trucks.

*When Spring Comes* by Kevin Henkes and Laura Dronzek, Greenwillow Books, 2018  
Relates to toddler's experiences with springtime, puddles, and backyard wildlife.



## Informational books for preschoolers and kindergarteners

***The Bee Book*** by Charlotte Milner, DK Children, 2018

Relates to children's investigations about bees, insects, and flowers.

***Because of an Acorn*** by Lola M. Schaefer and Frann Preston-Gannon, Chronicle Books, 2016

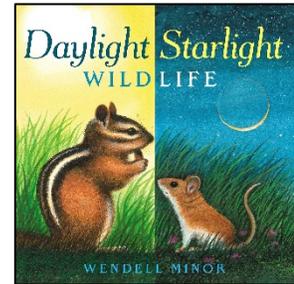
Relates to children's investigations about trees and habitats.

***Butterflies in Room 6: See How They Grow*** by Caroline Arnold, Charlesbridge, 2019

Relates to children's investigations about butterflies, life cycles, and kindergarten.

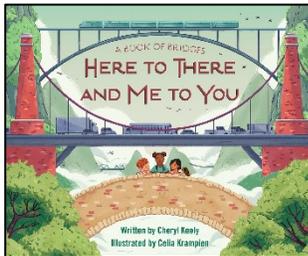
***Daylight, Starlight, Wildlife*** by Wendell Minor, Nancy Paulsen Books, 2015

Relates to children's investigations about day and night, forest creatures.



***Dogs and Cats*** by Steve Jenkins, HMH Books for Young Readers, 2012

Relates to children's investigations about pets.



***Here to There and Me to You: A Book of Bridges*** by Cheryl Keely and Celia Krampien, Sleeping Bear Press, 2017

Relates to children's investigations about bridges and travel.

***A Seed is the Start*** by Melissa Stewart, National Geographic Children's Books, 2018

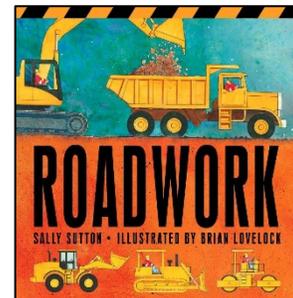
Relates to children's investigations about seeds and plants.

***Over and Under in the Pond*** by Kate Messner and Christopher Silas Neal, Chronicle Books, 2017

Relates to children's investigations about pond life.

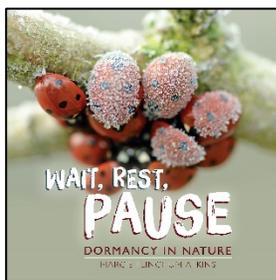
***Roadwork*** by Sally Sutton and Brian Lovelock, Candlewick, 2011

Relates to children's investigations about roads, road crews and large trucks.



***Ultimate Spotlight: Trains*** by Sophie Prenat and Vinciane Schleef, Twirl, 2020

Relates to children's investigations about trains and travel.



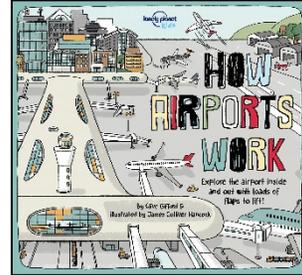
***Wait, Rest, Pause: Dormancy in Nature*** by Marcie Flinchum Atkins, Millbrook Press, 2019

Relates to children's investigations about winter and wildlife.

## Informational books for younger schoolagers

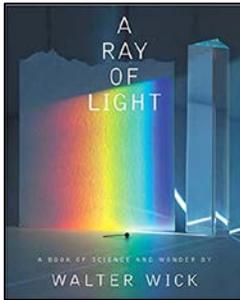
***Feathers: Not Just for Flying*** by Melissa Stewart and Sarah S. Brannen, Charlesbridge, 2014  
Relates to children's investigations about birds.

***How Airports Work*** by Clive Gifford and James Gulliver Hancock, Lonely Planet Kids, 2018  
Relates to children's investigations about airplanes, airports, and travel.



***How Did That Get in My Lunchbox?: The Story of Food*** by Chris Butterworth and Lucia Gaggiotti, Candlewick, 2013  
Relates to children's investigations about farming and food.

***Nature All Around: Trees*** by Pamela Hickman and Carol Gavin, Kids Can Press, 2019  
Relates to children's investigations about trees, leaves, and seasons.



***A Ray of Light*** by Walter Wick, Scholastic Press, 2019  
Relates to children's investigations about light, lenses, and rainbows.

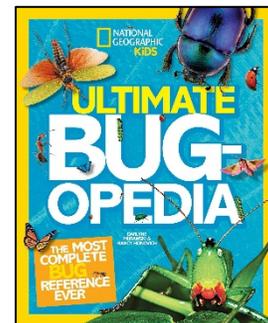
***A Rock is Lively*** by Diana Hutts Aston and Sylvia Long, Chronicle Books, 2015  
Relates to children's investigations about rocks and minerals.

***Rodent Rascals*** by Roxie Munro, Holiday House, 2018  
Relates to children's investigations about small classroom pets.

***The Street Beneath My Feet*** by Charlotte Guillain and Yuval Zommer, words & pictures Publishing, 2017  
Relates to children's investigations about underground engineering, animal life, and fossils.

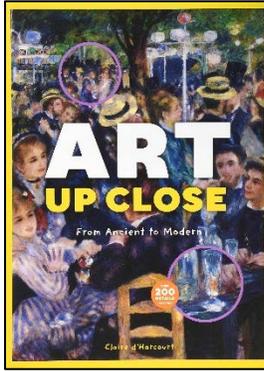
***Switch On, Switch Off*** by Melvin Berger and Carolyn Croll, HarperCollins, 2003  
Relates to children's investigations about electricity.

***The Ultimate Bugopedia*** by Darlyne Murawski and Nancy Honovich, National Geographic Children's Books, 2013  
Relates to children's investigations about insects.



***Water is Water*** by Miranda Paul and Jason Chin, Roaring Brook Press, 2015  
Relates to children's investigations about weather and the water cycle.

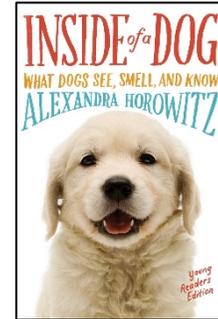
## Informational books for older schoolagers



*Art Up Close* by Claire d'Harcourt, Princeton Architectural Press, 2017  
Relates to youth investigations about art techniques, artists, and art history.

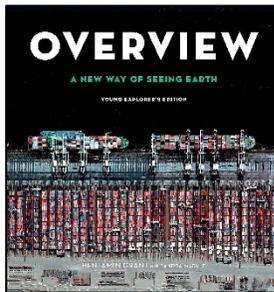
*DK Eyewitness: Hurricane and Tornado* by DK Children, 2014  
Relates to youth investigations about wind, weather, and natural disasters.

*Inside of a Dog – Young Readers Edition: What Dogs See, Smell, and Know*  
by Alexandra Horowitz, Simon and Schuster  
Books for Young Readers, 2017  
Relates to youth investigations about dogs.



*Music: The Definitive Visual History* by DK, DK Publishing, 2015  
Relates to youth investigations about music and musicians.

*National Geographic Backyard Guide to the Night Sky* by Andrew Fazekas, National Geographic, 2019  
Relates to youth investigations about astronomy.

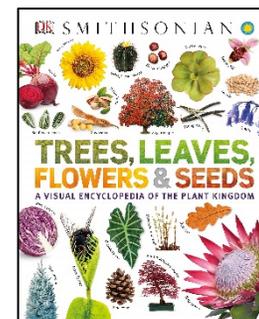


*Overview Young Explorers Edition: A New Way of Seeing Earth* by Benjamin Grant, Crown Books for Young Readers, 2019  
Relates to youth investigations about geography, climate, construction, engineering, and photography.

*The Science of Supercars: The Technology That Powers the Greatest Cars in the World* by Martin Roach, Neil Waterman, and John Morrison, Firefly Books, 2018  
Relates to youth investigations about cars, engineering, and design.

*Stephen Biesty's Incredible Cross Sections of Everything: Anniversary Edition* by Stephen Biesty, DK Children, 2020  
Relates to youth investigations about transportation, machines, architecture, and engineering.

*Trees, Leaves, Flowers, and Seeds: A Visual Encyclopedia of the Plant Kingdom* by DK and the Smithsonian Institution, DK Publishers, 2019  
Relates to youth investigations about types of plants and how they grow.



*The Wondrous Workings of Planet Earth: Understanding Our World and Its Ecosystems* by Rachel Ignatofsky, Ten Speed Press, 2018  
Relates to youth investigations about biology, ecosystems, and infographics.

# The Day Everett Brought a Snake's Skin to School

A classroom investigation shared by Mandi Edmonds, preschool teacher



It was a normal mid-week day morning in my preschool class. We were sitting as a group at the carpet having our meeting about what I had planned for us do that day. In walked another of my preschoolers – Everett – and his mom. As I greeted them both, I noticed that Everett had a huge smile on his face.

His mom said “Everett has something he would like to show you if it would not be a big disruption.” I said “Sure, let’s take a look”. Everett walked back out into the hall and then back into the room with a shed snakeskin. He found it that morning as he went to water his garden in his backyard at home.

Living in rural Arkansas, I had seen plenty of snakeskins before, but this was unlike any I had ever seen. It was fully intact and even the eye caps were still attached. Of course all the children ran over to Everett, excited to see the snakeskin. I almost suggested we all go back to the carpet to talk about what we were going to do that day, and that I would put the snakeskin in the science center for them to look at later. Almost.

What would **you** do if a snakeskin came to school?

But, the children’s eager faces and their excited questions, told me that this was a “seize the moment” opportunity. As Everett, his classmates, and I took the snakeskin back to the carpet, our “Great Snake” project was born. I asked Everett to tell his friends about how and where he found the snakeskin. We looked together and described the snakeskin. The children noticed that it was long, looked and felt sort of like paper, seemed fragile, and showed the patterns of a snake’s scales. Then the questions began. I grabbed a marker and some chart paper:

What do we want to know?

Is this snake dead?

Why do snakes shed their skin?

Is this snake taller than me?

Is this snake taller than my dad?

Is this the biggest snake in our town?

How long is the biggest snake in the world?

What do snakes eat?

Where do snakes live?

What kind of snake is it?

Will a snake bite me?

Can snakes swim?

Can you eat a snake?

Are worms snakes too?

How old is this snake?

Can a snake live to be 100?

Can snakes climb trees?

Do snakes have bones?

Can snakes run faster than I can?

The children and I read back through the list and admired their wonderful questions. I admitted that, honestly, I did not know a lot about snakes and couldn't answer all of the questions on the list. But, we could do some research together and find out.

Since many children seemed interested in the length of the snake, I suggested we take the shed snakeskin to one of our tables, get a measuring tape out of the science center, and see how long it actually was. We started a new chart and added the snake's length in inches. Each child took a turn lying down on the floor to have their length measured. Their name and length in inches was added to the chart. We found out that I was the only person in the room who was longer than the snake. This reminded the children of one classmate's question: "Is the snake taller than my dad?" The children decided that all of their dads were at least a little bit taller than me. That led them to the conclusion that this snake was not taller than their dads.

This generated a new question: "Are there any snakes in the world that *are* longer than a dad?" Our curiosity led us to the internet to find out about the longest snakes in the world. Together, we read that the world's longest snakes are the reticulated python and the giant anaconda. Both of these snakes have been recorded to grow up to 30 feet (360 inches) long. We were going to need a longer measuring tool! We invited our groundskeeper to join us in the hall with his extra-long tape measure. With his help, we rolled out 30 feet of painter's tape on the hallway floor.

Through our research, we had also learned that the largest venomous snake in Arkansas was a Western Diamondback rattlesnake documented at 8 ½ feet (102 inches). The children asked to mark that length in painter's tape on the hall floor, too. The children spontaneously decided to lie down on the floor head to foot to see how many of them it would take to be as long as these longest snakes. I could not have planned a better math lesson!

The children's ongoing interest in snakes was evident as they returned to play in our classroom learning centers. There were snakes made of playdough, snake paintings and drawings, snakes made out of lacing beads, and pretend snake soup dished up in our dramatic play center. Children crowded around the science center to examine Everett's snake skin with magnifying glasses. As we headed outdoors to play, the children launched into enthusiastic snake hunts on our playground. I was delighted with the spatial vocabulary that emerged as they instructed one another to search behind the trees, under the climber, and high along the roof line. We didn't find any real snakes on the playground, but we found plenty of imaginary ones!

Although all of the children seemed eager to learn about snakes, several expressed worry about snake bites. As we talked it through together, we agreed on this important safety rule for exploring outdoors: "Never put your hands or feet where you cannot see." To be on the safe side, the children decided to set up a pretend veterinary/doctor's clinic in one corner of the classroom. They explained that any classmate or toy pet who had been bitten by a snake needed come get a shot to help them get better. The sympathy and concern that they showed as they "rescued" and reassured one another made me feel good about our caring classroom community.

Our classroom began to fill with snake books, snake stories, and snake photos. Throughout the rest of that week and the next week, we researched and answered all the questions on our chart. Although most of our conversations centered around Arkansas snakes, I was reminded of one of my favorite childhood poems by Shel Silverstein, "I'm Being Eaten by a

## More snake facts we discovered

Snakes shed their skin because they are growing.

Most snakes shed their skin 2-4 times every year.

A snake's discarded skin is called a shed. Molting is another word that means the same as "shedding".

It does not hurt a snake to shed its skin. Snakes rub against rocks or tree bark to help pull the old skin off.

Humans shed their skin, too. But, unlike snakes who shed their whole skin at once, our old skin is replaced by new skin in tiny little bits every day.

There are 36 different species of snakes in Arkansas. Only six of them are venomous.

Snakes have bones - and lots of them! While we have about 33 vertebrae in our spines, snakes can have up to 400! Worms, on the other hand, don't have bones at all.

Snakes can't run, but they can slither by moving their bodies in a wavy motion. Snakes can also swim and climb trees.

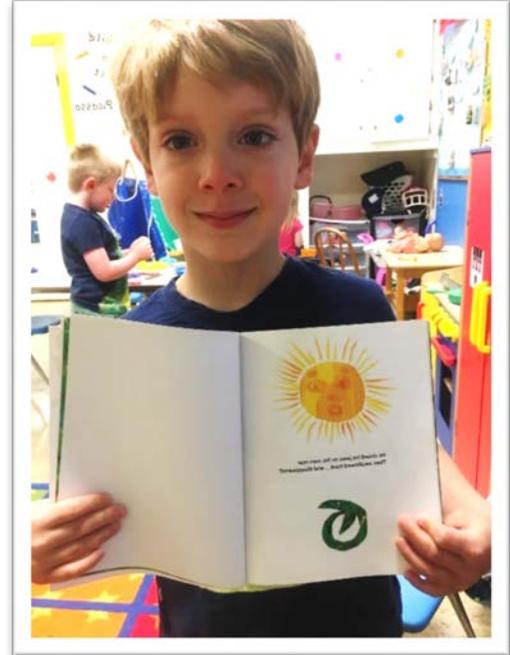
Boa Constrictor’’. (If you aren’t familiar with it, it’s worth looking up!) I recited the poem with the children and we laughed and laughed.

Before the project was over, a green body pillow case was donated. It became our “boa constrictor’’. The children thought it was hysterical to take turns stepping into the pillow case to act out the poem.

The family involvement in this project blew me away. Who knew that snakes would have been such a wonderful project? The kids in my class knew, that’s who!



Above: Snakes inspire stories and drawings.



Below: Pretend play. A veterinarian uses a “shot” to save a bird that has been bitten by a snake.



Above: Snake books from the library.

Below: Lacing bead snakes come to life.



**“The children’s eager faces and their excited questions told me that this was a ‘seize the moment’ opportunity!”**

On the morning that Everett arrived with his snake skin, the day’s activity plans had nothing at all to do with snakes. How fortunate for the children that their teacher was willing to set plans aside to share in their enthusiasm! Learning time was not lost as they investigated the snake skin. In fact, their teacher recognized that this unexpected event offered many exciting opportunities to build and strengthen skills.

As you go back and read through the story again, consider when and how each of the following Arkansas Child Development Early Learning Standards emerged:

### **Social Emotional Development**

#### SE2. Emotional Expression and Understanding

- ❑ SE2.2 – Interprets and responds to the feelings of others:  
Responds sympathetically to others’ distress with increased initiative...

*Teacher’s note:*

*4-year-olds seem to love things that are slightly scary. Maybe that’s why this snake investigation appealed to them so much. It gave them opportunities to express feelings of being afraid, but also opportunities to explore their ability to provide reassurance and empathy.*

### **Cognitive Development**

#### CD1. Approaches to Learning

- ❑ CD1.1 – Shows curiosity and willingness to try new things:  
Asks increasingly complex questions... and demonstrates interest in a range of topics and ideas.

#### CD2. Executive Function

- ❑ CD2.1 – Focuses and sustains attention:  
Shifts focus among various aspects of an object, activity, or story.
- ❑ CD2.4 - Holds and manipulates information in memory:  
Remembers and communicates about recent events.

Remembers past experiences or familiar stories with increasing ability to independently and accurately recall details and retell events in sequence.

*Teacher’s note:*

*Almost all of the children had stories about snakes. I guess that’s just part of growing up in rural Arkansas! They were eager to share their firsthand experiences and stories that had been relayed to them by family members. They were equally excited to tell their families all about our ongoing investigations at school.*

## Physical Health and Development

### PH2. Fine Motor

- ❑ PH2.1 - Demonstrates fine motor strength, control, and coordination:  
Handles smaller blocks, puzzle pieces, and manipulatives.

Teacher's note:

Anything that could be stacked or linked together became a snake. Our classroom was crawling with lacing bead snakes, marker cap snakes, link snakes, and unifix cube snakes! I was also excited to find some snake puzzles for our fine motor learning center.

- ❑ PH2.2 - Adjusts grasp and coordinates movements to use tools:  
Holds drawing and writing tools using three-point finger grip, using the other hand to hold the paper, to make a variety of lines and shapes.

Teacher's note:

Our snake investigation motivated children to write, draw, and paint about snakes. I noticed that they often seemed determined to replicate the wavy, S-shaped curves of a snake's body. Other times, they carefully dotted on each little scale. We added fine-tipped paint brushes to the easel to support their increasing attention to detail. They got lots of great practice using pencils, crayons, and paint brushes as they worked.

- ❑ PH3.2 - Shows awareness of safe behavior:  
Demonstrates knowledge of and ability to follow safety rules and routines with increased independence.

Teacher's note:

Often, adults have to be the ones putting the damper on some of the fun with safety rules for outdoor play. In this case, a safety rule emerged because the children were certain that it was important. They were eager to explain why the outdoor rule, "Never put your hands or feet where you cannot see" could help keep everyone safe.



## Language Development

### LD1. Receptive Language

- ❑ LD1.1 - Understands and responds to language:  
Understands an increasing number of words for objects, actions, and characteristics encountered in real and symbolic contexts.

## LD2. Expressive Language

- ❑ LD2.1 – Uses increasing complex vocabulary, grammar, and sentence structure:  
Uses increasingly complex and varied vocabulary words to express needs and describe objects, relationships between objects, emotions, and actions.

Tells increasingly detailed stories about other times and places, with increasing accuracy in use of past and future tenses.

## LD3. Communication Skills

- ❑ LD3.1 – Communicates using social and conversational rules:  
Engages in back-and-forth conversations of increasing duration, with increasing ability to extend conversations by asking questions and making comments related to the topic...

*Teacher's note:*

The language that emerged during this study blew me away! It seemed like the children talked constantly about snakes and we began to hear them using words like "scales", "shed", "venomous", "fangs" and "habitat". They asked some pretty amazing questions, too. Parents commented about how much the children were learning about snakes that they - the adults - never knew.

## Emergent Literacy

### EL1. Engagement in Literary Experiences and Understanding of Stories and Books

- ❑ EL1.1 – Shows interest in literacy experiences:  
Participates in and actively seeks out a variety of literacy experiences such as telling and listening to stories, singing and saying rhymes, engaging with writing materials, and incorporating books or other print into play.

*Teacher's note:*

There were so many ways to connect the children's interest in snakes with charts, songs, poems, and books. They especially had fun acting out the Shel Silverstein poem, "I'm Being Eaten by a Boa Constrictor".

- ❑ EL1.2 – Engages in read-alouds and conversations about books and stories.  
Demonstrates knowledge from informational texts in a variety of ways and makes connections to other books or personal experiences.

*Teacher's note:*

It took some looking to find just the right informational texts for our group. We needed books that had new and interesting facts about snakes, but that didn't have gory photos that they weren't quite ready for yet. It was worth it when they'd say, "Hold on!" in the middle of a conversation and head to our classroom library to retrieve a book to prove a point or answer a question.

### EL3. Knowledge and Use of Books, Print, and Letters

- ❑ EL3.1 – Responds to features of books and print:

Shows understanding that print conveys a message and can represent spoken language.

*Teacher's note:*

*This study gave us lots to write about!*

*We started with a chart of their questions, writing down exactly what each of them said. We came back to the chart again and again to write down answers as we learned new information. They asked us to add lots of dictations to their drawings, too. It even motivated some of our older children to do writing of their own: "How do you spell 'snake', again?"*

### Mathematical Thinking

#### MT1. Number Concepts and Operations

- ❑ MT1.1 - Demonstrates number sense and an understanding of quantity:

Counts to determine and compare whether the number of objects in one group is more than, less than, or the same as objects in another group.

#### MT3. Measurement and Comparison

- ❑ MT3.1 - Participates in exploratory measurement activities and compares objects:

Directly compares objects to see which is longer.

Uses comparative language to directly compare two or more objects.

*Teacher's note:*

*Long, longer, longest - Everett's super long snake skin inspired the children to want to find out about the biggest snakes in Arkansas and the world. That naturally set the stage for lots of measuring and comparing. We even had to find a school helper with a longer measuring tool to help us get the job done.*

#### MT4. Geometry and Spatial Sense

- ❑ MT4.1 - Explores and describes shapes and spatial relationships:

Uses increasingly complex spatial vocabulary.

### Science and Technology

#### ST1. Scientific Practices

- ❑ ST1.1 - Engages in scientific process to collect, analyze, and communicate information:  
Asks questions about the world and seeks answers from various sources.

Makes increasingly complex observations about objects and events.

With adult assistance, analyzes, interprets, and communicates data.



## ST2. Knowledge of Science Concepts

- ❑ ST 2.1 - Demonstrates knowledge of core science ideas and concepts:  
Makes observations and generalizations about structure and function [e.g., generalizes about why birds can fly and people can't].

Demonstrates an understanding that living things change over time in size and other capacities as they grow.

## ST3 Knowledge of Science Content

- ❑ ST3.1 - Demonstrates knowledge of the characteristics of living things, the earth's environment, and physical objects and materials:  
With increasing independence, asks and answers questions about the similarities, differences, and categories of plants and animals.

Shows curiosity and knowledge about how living things grow and change over time.

*Teacher's note:*

*The children were astute investigators as they searched for answers to their questions. They seemed hungry for true information about how snakes are born and how they live. Each question we answered seemed to inspire even more questions.*

- ❑ ST3.2 - Uses tools and engineering practices to explore and solve problems:  
Uses a variety of tools to gather information, investigate objects, and solve problems.
- ❑ ST 3.3 - Engages in developmentally appropriate interactions with technology and media that support creativity, exploration, and play:

Identifies technology tools for multiple purposes, including creating, problem solving, gathering information, and documenting.

*Teacher's note:*

*We put our classroom tools to work as we investigated snakes - especially our measuring tools, magnifying glasses, and digital camera. The children also demonstrated that they understood the power of the internet for finding answers to their questions: "Let's Google it!"*

## Social Studies

### SS1 Family, Community, and Culture

- ❑ SS1.1 - Demonstrates positive connection to family and community:  
Shows increasing awareness of the roles people play in society.

*Teacher's note:*

*I wouldn't have guessed that a snake project would lead us to think and learn about community helpers, but it definitely did. Over the course of the project, we talked about rangers, EMTs, physicians, veterinarians, pet shop owners, biologists, and even wildlife control officers.*

## SS2 History and Geography

- ❑ SS2.2 - Demonstrates simple geographic knowledge:  
Communicates with increasing specificity about the location of objects and areas at home and school.

Discusses basic geographic concepts and features of environments.

*Teacher's note:*

Wondering "Where do snakes live?" set the stage for finding out more about the different natural features in our community. The children were surprised to find that almost all snakes can swim, but some snakes only live in or near water.

## Creativity and Aesthetics

### CA2 Visual Arts

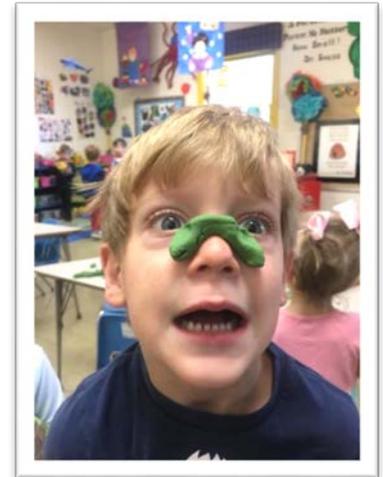
- ❑ CA2.1 - Explores, manipulates, creates, and responds to a variety of art media:  
Engages in child-initiated visual art activities with increased independence, intentionality, planning, and knowledge of art media and materials.

Communicates with others about art by discussing the ideas behind own art and how it was made.

*Teacher's note:*

Snakes inspired our preschool artists in so many ways. It was interesting to see how much more detailed their work became over time. Pretty soon, our playdough and clay snakes had eyes, fangs, and forked tongues! I overheard children asking one another, "How'd you make that?" - and teaching one another their best snake-making techniques.

Some of the children's drawings and paintings represented scenes from favorite books or their own, elaborate and imaginative snake stories.



### CA3. Drama

- ❑ CA3.1 - Explores feelings, relationships, and concepts through imitation, pretend play, and sociodramatic play:  
Explores a variety of themes and roles through play, including real-life scenarios, fictional stories and characters, and play that expresses feelings and helps process experiences.

Engages in increasingly complex, longer play scenarios; assigns or assumes multiple roles within a scenario; tells more cohesive stories through play.

*Teacher's note:*

I've noticed that all of children's feelings and big ideas come out in their pretend play. Our snake-inspired play sometimes reflected true-to-life scenarios: "You be the veterinarian. Hurry - get a shot to make the puppy better. She got bit by a big diamondback rattler!"

Other times, their pretend play was fanciful. Snake-eating dinosaurs were a recurrent play theme for at least a week. I wonder if being dinosaurs gave the children a reassuring feeling of power and control?



What if had Everett brought in a turtle shell that first morning, instead of a snake skin? What different conversations and experiences might that have inspired?

The actual topics of investigations will vary from year to year, and that’s okay. The beauty of inquiry-based learning is that any first-hand experiences that interest children will motivate them to ask questions, use emerging math and literacy skills, and learn about their world.

### **To identify strong topics for further exploration, consider:**

#### **1. What is going on in children’s lives right now?**

Consider your surroundings, the season, and events in your community and neighborhood. The most meaningful investigations are inspired by first-hand experiences. That means that children can get “up close and personal” with real people, places, and objects related to the topic. Amazing investigations have been inspired by all sorts of experiences, large and small. Here are a few examples:

- Finding worms or crickets on the playground
- Observing large trucks rumbling past the school
- Discovering something especially interesting about materials, such as how paint colors mix or how wet sand becomes slurry
- Noticing landscapers or repair people working around the building
- Experiencing windy, icy, or rainy weather
- Getting new shoes or boots

#### **2. What are children curious about?**

What scripts or patterns occur most often in their play, and seem to have the highest degree of importance to them? Look carefully to really see what children seem to be eager about.

One preschool teacher shared that the big trucks suddenly became popular with her group during outdoor play. At first, she wondered if they might be interested in construction sites.

As she observed their play some more, she came to realize that they seemed most interested in rolling the trucks up and down plank ramps. The project that emerged was an exploration of ramps, chutes, and things that roll.

**3. What do children talk about?**

Listen to children as they play, look at books, and talk with adults and peers throughout the day. What questions do they ask? What stories do they tell? Which topics of conversation come up often and with intensity?

**4. What do children know so far?**

**What additional possibilities does this topic hold?**

When Everett's snake skin came to school, it generated many questions from children. Their comments and questions told their teacher that they had some knowledge about snakes already, but seemed highly interested in learning more. During their initial experience, she began to see many possibilities to investigate alongside children.

Using observations and conversations with children, teachers consider:

What main ideas around this emerging topic do children seem genuinely interested in? It is also valuable to consider how the investigation could potentially support goals for children's learning and development, including mathematics and literacy.

**5. Will we be able to bring this topic to life through experiences in the classroom, outdoors, and/or in our community?**

The best investigations include many concrete, appealing opportunities to observe, experiment, and interact with real people and objects. There are problems for children to solve and truths to discover. Videos, pictures, songs, and books can enhance learning, but should not take the place of actual experiences. As inquiry-based learning emerges, teachers consider:

- What materials do we currently have for children to investigate?
- What additional materials could we make, find, buy, or borrow to enhance and extend our investigation?
- Are there any changes to our environment or daily schedule that would support children's ability to investigate this topic?
- Where else – around our school or in our community – could we go to investigate? What permissions and provisions would be needed to do this?
- Who could support this investigation? Which family members, program staff, and/or community members who might be able to help answer children's questions?

On the page that follows, you can read one teacher's initial answers to these questions.

**Our group seems interested in:**

*things with wheels*

**What materials do we currently have for children to investigate?**

*Large trucks in the outdoor sandbox  
Wagons, trikes, and scooters outdoors  
Cars in the block area*



**What additional materials could we make, find, buy, or borrow to enhance and extend our investigation?**

*Actual tires for rolling on playground - someone might donate old ones  
Wheelbarrow or wagon for playground  
Construction kits with wheels - borrow from other class  
Rollers for paint and playdough - craft store  
Casters and other small (real) wheels for science center - ask families, maintenance  
Books from library, toy catalogs, car and motorcycle magazines*

**Are there any changes to our environment or daily schedule that would support children's ability to investigate this topic?**

*Define a clear space outdoors to for rolling tires.  
Create space next to the tricycle track where children can safely turn wheeled toys upside down to investigate.*

**Where else – around our school or in our community – could we go to investigate? What permissions and provisions would be needed to do this?**

*Park a car at the edge of the grass so children could investigate in small groups by examining, counting, sketching, photographing - get field trip slip and use traffic cones.  
Walk around our school to look for wheels on chairs, carts, etc.  
Possibly walk to visit bicycle shop? (Would need field trip slip and chaperones.)*

**Who could support this investigation? Which family members, program staff, and/or community members who might be able to help answer children's questions?**

*Family members might be able to bring additional vehicles for the children to investigate - motorcycle, big truck, show car, tractor.  
Would someone want to demonstrate changing a tire on a car?  
Bailey's Grandpa might let children look at his wheelchair.  
Jayden's sister collects skateboards.*

# Choosing Topics for Learning

Each day that we share with children offers beautiful possibilities to support learning and development. How do we invest that time? What guides us as we choose topics and experiences to fill our days? Through the choices we make, we can nurture children as active explorers of their world.

The most powerful topics for learning:

- Captivate children’s interest and spark curiosity.
- Can be investigated by children in real life, in hands on ways.
- Offer many opportunities for learning and discovery.

Using that lens, take another look at the themes or topics that guide your activities and experiences. Many topics that seem fun and appealing at first glance are too far removed from children’s real life experiences. Consider one teacher’s experience:

As she browsed online for ideas for her classroom, a preschool teacher came across charming plans for a circus theme. She jotted down ideas for clown collages, lion masks, and hoop-jumping games. She stopped by the library to gather books about the circus and even draped a parachute from her classroom ceiling to resemble a circus tent. This was going to be an exciting week!

Children and families noticed the parachute “tent” right away and there was a flurry of excitement. As she began to share the planned circus activities with children, however, she was surprised that their enthusiasm seemed fleeting. They showed mild interest in the activities, but their conversation and play quickly drifted in other directions. Circus Week in the classroom was not turning out to be as fun as she had hoped.

As she reflected with her teaching partner about their week, she realized: Her preschoolers had never been to a circus. Most of them had only seen lions and clowns on cartoons. Circus activities in the classroom couldn’t inspire rich discussions and thoughtful investigation because children’s firsthand experiences with the circus were simply too limited.

## Guiding Questions

What might have gone differently if the teacher described above had used these questions to guide her planning?

Children communicated their interest in this topic when they...

This topic builds on children’s prior experiences with...

We will have authentic, firsthand experiences with this topic when we...

Children will be able to actively investigate this topic when they...

This topic/experience feels like an especially good fit for us because...

## Topic Swaps

When we choose topics that children can investigate in real life, they are eager to tell about their experiences and ready to learn more. Children are full of questions and have an innate desire to understand their immediate world more deeply. When meaningful investigation is at the heart of daily plans, our indoor and outdoor learning environments become vibrant, exciting places.

Below, you'll find a list of list of possible topics for learning. The popular topics on the left side often appeal to children and adults, but they don't usually relate to the firsthand experiences of young children living in Arkansas. Consider the alternative topics suggested in the right-hand column. At first glance, these may seem less exciting. Upon reflection, however, each offers plenty to explore, figure out, and talk about. Teachers are often surprised to discover that children engage most enthusiastically in the topics that reflect the world around them.

If you're considering this:	Try one of these instead:
Beach/Ocean	<b>Sand and water</b> <b>Puddles</b> <b>Pond life</b>
Circus	<b>Pets</b> <b>Balls</b> <b>Things with wheels</b>
Dinosaurs	<b>Backyard creatures</b> <b>Dirt and rocks</b> <b>Construction</b>
Jungle/Rainforest	<b>Songbirds</b> <b>Trees and leaves</b> <b>Insects</b>
Outer Space	<b>Day and night</b> <b>Sun and shadow</b> <b>Mirrors and light</b>
Penguins/Polar Animals	<b>Ice and snow</b> <b>Arkansas animals in winter</b> <b>Hats, jackets, scarves and mittens</b>
Pirates	<b>Boxes</b> <b>Locks and keys</b> <b>Boats</b>
Wild West	<b>Farm</b> <b>Hats</b> <b>Camping</b>

## Myths and Truths About Learning with Children

**Myth: We must follow a list of themes.**

When teachers follow a theme list, they focus on the same topics year after year. Yet, no two groups of children are the same, year after year. Consider choosing topics of learning as each year progresses, guided by your observations of this group of children. What are children interested in?

**Myth: We must outline all of our objectives for learning before we begin a topic of study.**

It *is* good to plan ahead, focusing on objectives for children’s learning and thinking about how daily experiences can support them. However, we can also remain flexible enough in our planning to respond to children’s interests. Topics of study can be shaped by the children’s questions – as the topic begins and throughout the study. What do children really want to know?

**Myth: Topics of study must last for a set amount of time, like a week or two.**

The pace and duration of a study can be guided by the investigators (the children). By observing and talking with children, we notice when their questions about the current topic have been answered and new topics have sparked their interest. That’s when they’re ready to move on to something new. That means that a topic that fascinates children could last for weeks or even months – and that’s okay! When do children feel satisfied with their learning?

**Myth: The most meaningful activities are teacher-led.**

Planned experiences – like a cooking activity or visit with a special guest – absolutely promote and extend learning. However, not all powerful experiences are directed by adults with specific outcomes in mind. There are times when the teacher’s role is to “set the stage” by providing time, space, and interesting materials to explore, giving children permission to use these in their own ways. What will children decide to do? What will they discover as they direct their own investigations?

**Myth: Once we’ve identified a topic of study, everything we do must support that topic.**

It’s true that we promote rich, meaningful learning by immersing children in experiences with props, books, and other materials that support the topic at hand. However, if a study is a journey, there’s plenty of time along the way for interesting detours. In other words, it is absolutely okay to spontaneously follow other ideas and interests that emerge each day. Make time to reread a favorite funny story, to talk about current events in children’s lives, and to explore the little surprises that each day brings. What captivates children’s interest in the here and now?

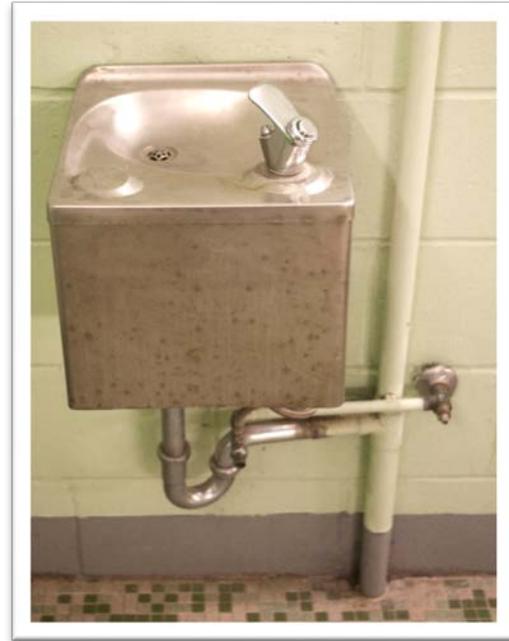


# “Where Does the Water Go?”

A classroom investigation shared by Kim Burd and Laura DeLuca,  
John L. Hensley Elementary School, inclusive early childhood classroom teachers

One morning, as the children arrived and lined up inside the halls, one boy looked under the small water fountain and was curious about where the water was going or coming from. Other children saw the boy lying on the ground looking under the fountain. They asked him what he was looking at under the fountain. They asked him what he was looking at under the fountain. More children took turns looking under the fountain and discussed where the water was going and coming from.

Later that morning and again in the afternoon, we began a web after walking around our hallway. We made observations of pipes and talked about where the water was going. The children shared that they knew about pipes from observing familiar places. They talked about the pipes they had seen in their homes, in the school, and around town.

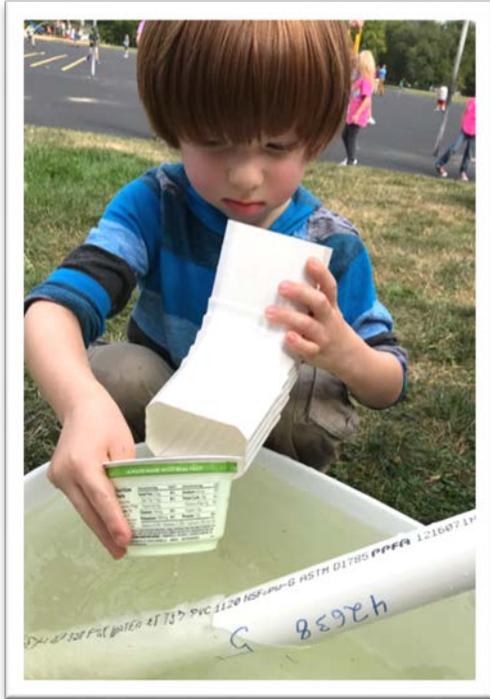


Have you ever looked at a sink or fountain and wondered, “Where does the water go?”

Below: Investigating pipes around our school building.

Below, right: Creating a web about pipes and water.





We provided water play experiences for the children to encourage their thinking about the pipes and where the water came from. They began to ask questions and hypothesize about where the water was coming from. We provided real pipes to play with and toy pieces so the children could build their own “water makers,” or water sources.



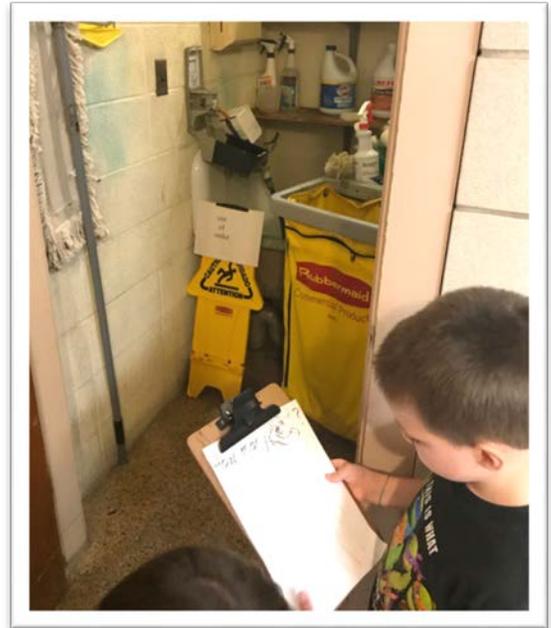
Throughout our conversation, the children kept asking: “What makes water?” We decided to find the “water makers” in our school first. The children completed surveys in teams. We predicted how many of each thing we might find in our school.

### Our Survey Questions

- How many sinks?
- How many toilets?
- How many water fountains?
- How many urinals? (new vocabulary)
- Does the school have a bathtub?
- Does the school have a washing machine?

Above: Exploring pipes and water flow during outdoor play.

Right: Collecting data – a child finds a “water maker” in our school.



We also sent a survey home about pipes and plumbing. We realized that we had fathers of children in our classes who were local plumbers. They visited as experts in our classrooms. We had prepared questions for the plumbers based on our investigation in our homes and around the school. We wrote down their answers and paired pictures with the answers to help explain where that water was coming from and where it was going.



Above: A plumber visits as a guest expert.

Far left: Children add pipes to a cardboard house.

Left: Tracing plumbing tools.

The children showed the plumbers what they had started building in the classroom with paper towel tubes and tape. They were impressed! The children were allowed to see, touch, and explore all the tools and materials that are on a plumber's truck. The plumbers gave the children real materials (PVC pipes, plastic tubing, joints, and a faucet) for the cardboard house they had constructed so far. Our expert visitors also provided us with lots of new vocabulary about pipes and plumbing.

As the project continued, the children became most interested in constructing their own pipes and being able to run pretend water through them. We learned if we ran real water through our paper pipes they would fall apart. We looked throughout the classroom and discovered things in loose parts that might run through the pipes. Some worked and some got stuck. As the children added pipes to the cardboard house in the classroom, they learned some pipes they built were too long, too short, or too crooked and needed to be worked on so they would work.

The children traced and drew colorful pipe designs. They also continued building outdoor water pipes. Some children designed and built pipe projects for the needs that emerged from their play. One boy constructed a shower and bath for his dog. Two other friends created a super tall pipe for their small balls to run through and go fast.



Above: Two boys create a pipe to carry balls.

Left: Children create a “dog shower”.

We returned to our initial web during the last week of the project. The first thing we noticed was how the children expanded their vocabulary about pipes and plumbing. We also realized that they could speak about the topic using more complex sentence structures and seemed interested in talking about the topic for an extended period of time together at a group meeting.

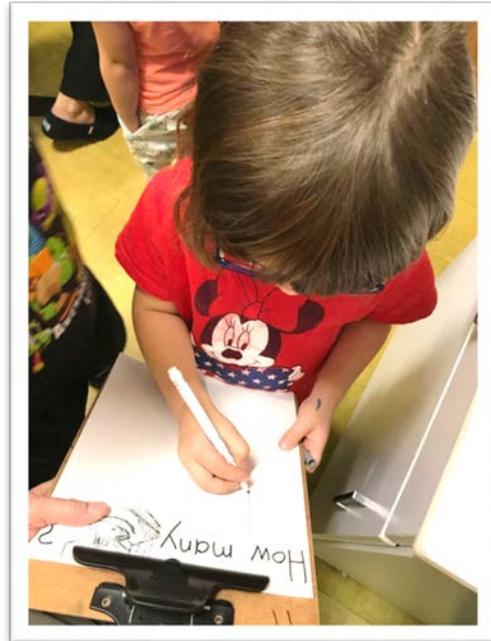
### **Teacher reflection**

This investigation took place with the morning and afternoon groups of our inclusive early childhood classroom. Our curriculum is play-based and experiential in nature. Topics of study are chosen based on children’s interests and individualized education plan (IEP) goals. Most children had experience with several prior investigations before beginning this study of pipes, which lasted about eight weeks. Because of their past experiences with us, the children were familiar with discussing, making observations, sketching, and webbing.

We loved how authentically this project emerged. We remember our teaching teams just watching the wonder around the water fountain that day, then looking at each other and nodding. . . “we have an interest!” Enthusiasm continued as we noted how our school was full of pipes and then investigated our building for “water makers.” We were also really fortunate to have connections to plumbing experts who helped extend our learning and add artifacts to our environment.

Children were eager to share their learning with friends throughout the project. After conducting a survey or tally, children were invited to report back to the group about their findings. It created a lovely communication opportunity and often solidified critical skills in number relations, communication, or literacy. The “pipe house” also was a fun way to let all levels of investigators practice different skills. Some children conducted the construction, some problem solved, and some added to the design. Others practiced things they knew how to do such as drop objects down pipes or cut tubes or tape.

To share our Pipe Project with our families, we created two binders, one for the morning class and one for the afternoon class, to showcase our learning. The binders included lots of pictures, surveys, tracings and drawings, language samples, stories from our play, research from our experts, and a list of all those things we wondered about the pipes around us.



The project memory books we made to culminate our project learning were an effective way to share documentation with families. These books were able to pass from home to home in a take-home bag, and children were able to recall events and discuss their experiences with their families. Sharing the books made a meaningful close to the project.



Above: Collecting data is an important job.

Left: A final surprise for the children came when the plumber installed a sink in our outdoor classroom.

The children and teachers in this classroom use the **Project Approach curriculum**. To learn more about Project Approach and find out more about the Pipes Project and others, visit:

<https://illinoisearlylearning.org/pa/>

<http://projectapproach.org/>

<https://www.naeyc.org/resources/topics/project-approach>

# Making the Most of Moments of Wonder

**There are no seven wonders of the world in the eyes of a child.  
There are seven million.”**  
– Walt Streightiff

An infant bangs two metal bowls together with obvious delight.

A toddler flips a tricycle upside down to spin, spin, spin the wheels.

A preschooler lingers at the sink, wriggling his fingers through the flowing water.

A kindergartener gloops puddles of glue onto her marker drawing, noticing how the colors lift and swirl.

A first grader drops to the ground to examine earthworms that have come to the surface after last night’s heavy rain.

In everyday moments like these, we catch a glimpse of the explorer’s heart within each child. The world around them seems to fall away as curiosity intensifies. They’ve found some new surprise or sensation, or a new idea has come to light.

It can be easy for busy adults to miss these moments of discovery or even to become impatient with children. Perhaps they linger too long when we need them to keep up, or perhaps we’re caught off guard by investigations that are noisy, messy, or unexpected. If we aren’t mindful of moments of wonder, we can find ourselves hurrying or scolding children, dissuading their curious spirit.

Our responses to their moments of wonder can be encouraging, rather than discouraging, supportive rather than stifling. We can show children that we honor their roles as explorers of their world in these two, powerful ways:

## 1. Step Back, Give Space

We trust children’s ability to tune in to – and benefit from – their innate curiosity. We respect the flow of the child’s exploration and take care not to disrupt them. Rather than asking the child, “Why are you doing that?”, we ask ourselves, “Why not?” This simple shift allows us to give children time and space to continue their self-directed investigation as long as they can safely do so.

## 2. Lean In, Encourage Investigation

If the child welcomes us in, we become partners in learning. We mirror their enthusiasm and listen closely to their ideas. We respond with curiosity of our own, asking, “What do you notice?” and “I wonder why...” We may offer resources to enrich their investigation or help them communicate their discoveries with peers. In responding this way, we assure children that their thoughts and ideas are important.

# It Began with a Bird

An out-of-school time investigation with second and third graders

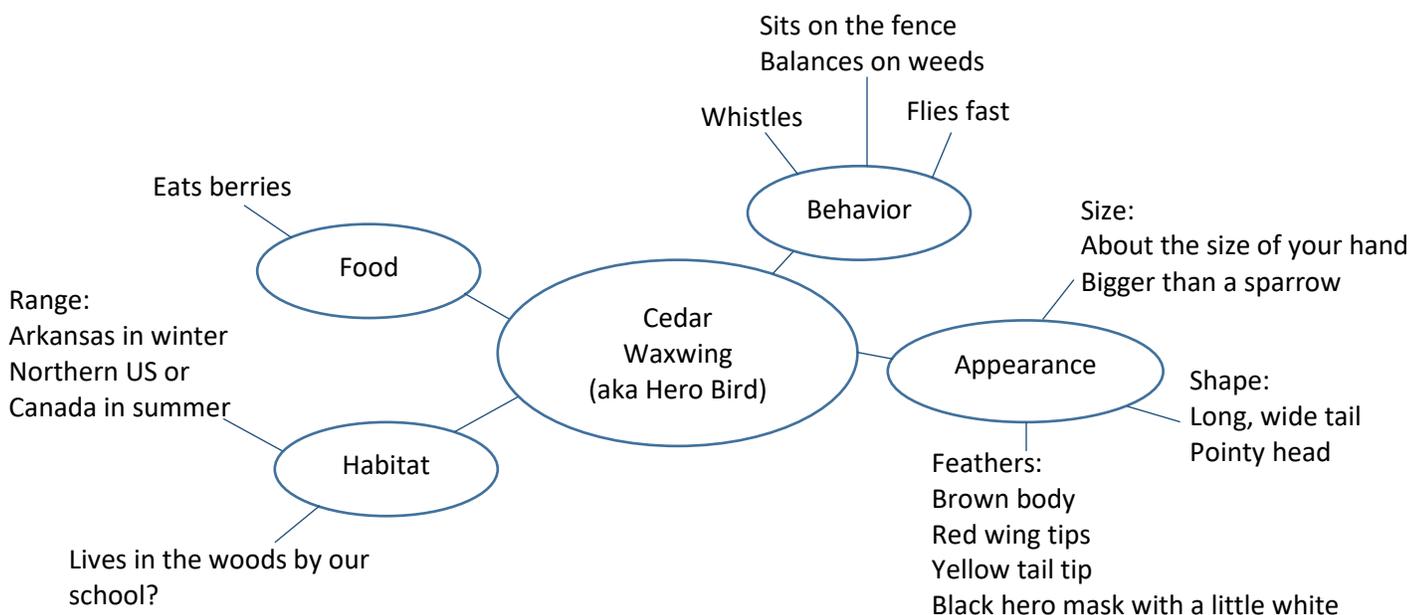
It all began with a little, brown bird.  
It was mid-winter and the schoolagers were enjoying outdoor play on a crisp, sunny afternoon.  
The bird caught the children’s eye because they had never noticed one like it before. Not only did it have bright red wingtips and a bright yellow tail, but it had a stunning black mask that reminded them of a superhero. Its call was a high-pitched whistle:  
“Zeee-seeee, zee-seeeee!”



Right away, they wanted to know: “What kind of bird is that?!” Their group leader, Mr. Tyler, admitted that he didn’t know. The children decided, for the time being, to call it “Hero Bird”.

The next day, one of the children eagerly pulled a bird guide from his backpack. He’d checked it out from the school library earlier that day. Classmates crowded around to look for their bird. It turned out that Hero Bird was actually a Cedar Waxwing. Children read that cedar waxwings often travel in large flocks and feed primarily on berries. They learned that the bird they saw was male – identified by the colorful wingtips. By studying a map in the book, they discovered that he flies each autumn to warmer states like Arkansas, spending the winter here before returning north in the spring.

Mr. Tyler suggested that they could make a web to record things they wanted to remember about the cedar waxwing.



It was evident that the children had already learned a lot about the bird by observing and by using the field guide. By the time they finished their web, they had generated lots of additional questions:

#### Our Questions About the Cedar Waxwing

- Why is it called a cedar waxwing?
- Why does it have a mask?
- Where (in the Northern US or Canada) did this waxwing come from?
- What is it like there?
- If cedar waxwings travel in flocks, why is this one alone?
- Is it lonely?
- Can it find berries to eat around our school? Where?
- Are there any girl (female) cedar waxwings around our school?
- If we put out berries, would more cedar waxwings come?

When the group headed outside, they packed pencils, paper, clipboards, and their digital camera. If they spotted the cedar waxwing again today, they planned to make sketches and take photographs of it. Outdoor time was almost over – with no sign of the bird – when one of the children heard its shrill, whistling call coming from the edge of the woods. Within minutes, the bird was spotted!

Children noticed the direction it flew as it headed back into the woods. With Mr. Tyler's help, they planned a nature walk for the following afternoon. The group wanted to know where the cedar waxwing was coming from and whether there were more waxwings in the woods. As they planned their walk, they talked together about food, water, and shelter that birds might find in the woods.



As they explored the woods, the group came across a shallow creek at the bottom of a hill. That meant that the waxwing had a source for water. There were plenty of trees and bushes around and the children hypothesized that the waxwing could take shelter inside dense brush or in the cavities of trees. This left the question of food. The children recalled that fruits and berries are a primary food source for cedar waxwings, but most of the trees in the wood were oak. Even if there were fruit trees or berry bushes, they knew that fruit was not in season.



The mystery was solved when they found a stand of juniper trees on a ridge. The trees were covered in small, purple-blue berries. Although the group’s approach had startled away any birds that might have been in the bushes, there was evidence under and around the tree that led children to know that the berries were a food source for some sort of birds. They headed back to school with the more specific question, “Do cedar waxwings eat juniper berries?”

More books were collected from the school library. In one of them, children read that cedar waxwings will eat juniper berries when food is scarce, but that they seem to prefer other berries. This led the children to suggest offering strawberries or blueberries to the bird that visited their playground. Mr. Tyler suggested that they might want to find out more about feeding wild birds.

The manager of a local wild bird supply store was invited to come in to talk with the group. He brought examples of different kinds of bird feeders and samples of many different kinds of bird feed. An informal question and answer session provided new information to guide the project. Now, the group wasn’t just interested in feeding the cedar waxwing – they were interested in feeding as many kinds of birds as possible.

They wrote letters to their principal, seeking permission to create bird feeding stations around the school. In their letters, they explained why they felt that feeding birds was important, especially in wintertime. He wrote back, granting permission and even donating money to support their cause.

For their feeding stations, the children chose hanging seed feeders designed for large and small birds, a suet feeder, and a low platform feeder that could be used for fruit. They worked in groups to identify sites for each feeder and drive mounting posts into the ground. Then, they assembled, mounted, and filled the feeders. They recalled that their bird feeding expert told them that it could take about a week for birds to notice and begin to use the feeders. Brave chickadees came first and other birds soon followed.

Soon, the children could identify many of the frequent visitors: finches, juncos, and grosbeaks along with the more familiar cardinals, blue jays, and sparrows. They were curious about which birds preferred which feeders. With Mr. Tyler’s encouragement, they outlined a plan to collect data. Teams of children planned to take turns watching each feeder, recording how many – and what kinds – of birds visited during their watch.



Observers used binoculars to relay information to recorders who marked tally sheets. After a week of intensive observation, they created bar graphs with their results. Ground trays proved most popular with juncos, sparrows, and squirrels. The cedar waxwing also visited the ground tray several times. Hanging feeders seemed to be preferred by finches, cardinals, buntings, titmice, and grosbeaks. Squirrels and jays used both feeders. Sunflower seed was the most popular food choice.

Children were perplexed that feeders that they filled each evening were empty the following morning. They researched nocturnal birds, but found that most night birds are hunters – not seed eaters. Who was eating all of the seed? One of the parents loaned the group a motion-sensing game camera and showed them how to mount it near their feeding station. The next day, children eagerly scanned the video to identify the late night snackers. Raccoons!

Even though that mystery was solved, children were still curious about their cedar waxwing. He had only visited the feeders a few times, despite their offerings of seed and fruit. He still seemed to be all alone. A biology teacher from the high school came to talk with the group about their favorite bird. Here are some of the things they found out:

#### Our Answers About the Cedar Waxwing

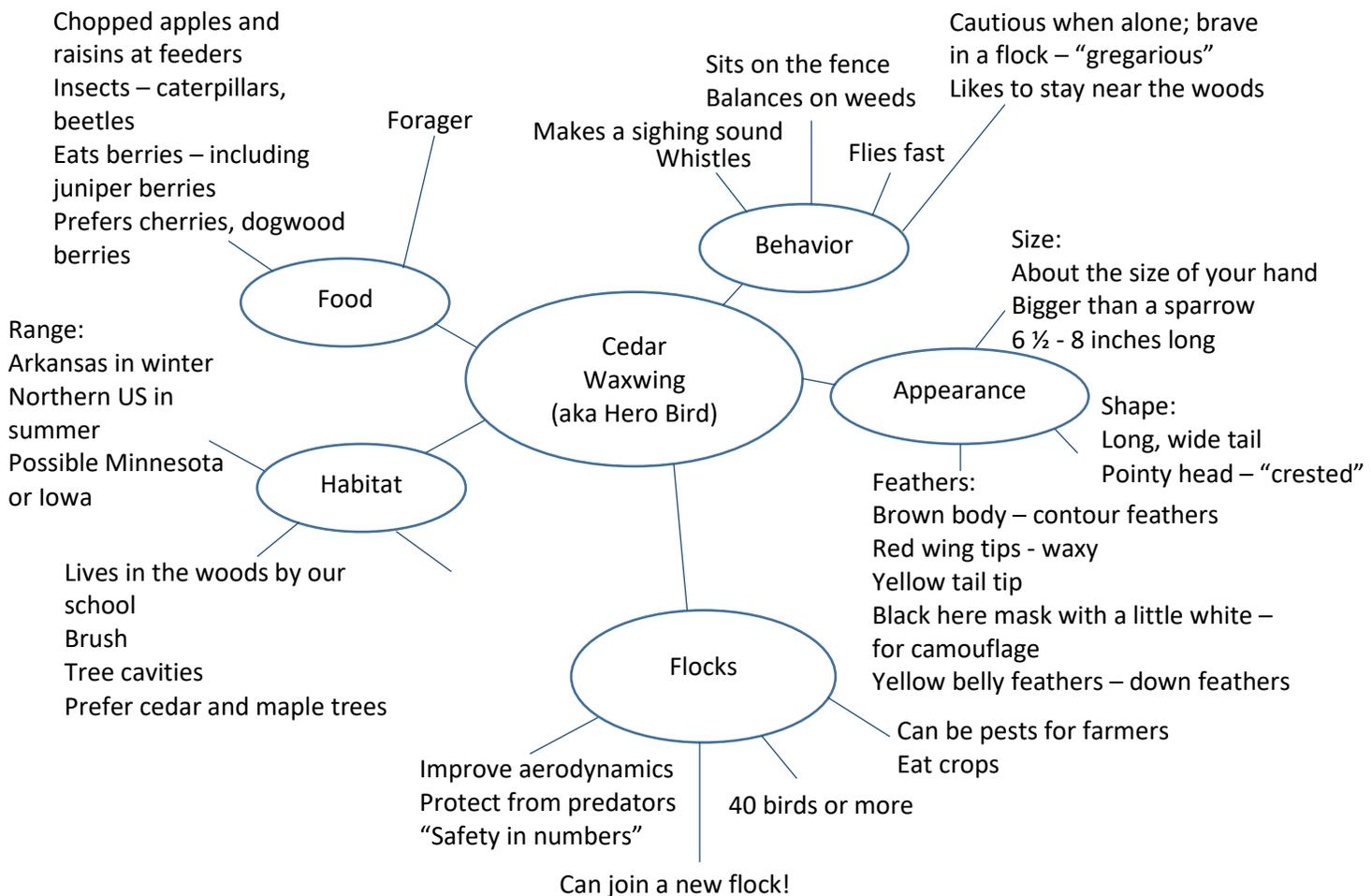
- Why is it called a cedar waxwing? Its wingtips have a waxy texture. It sometimes lives in cedar trees.
- Why does it have a mask? It may be a form of camouflage. It makes it harder for predators and prey\* to see the bird's eyes.
- Where (in the Northern US or Canada) did this waxwing come from? It's isn't possible to know for sure. Possibly Iowa or Minnesota, since those states are directly north of Arkansas and waxwings live there in the summer.
- What is it like there? They have deciduous forests and farmland like we do. spring and summer are similar but there is more snow and ice in winter.
- If cedar waxwings travel in flocks, why is this one alone? It may have been separated from its flock by a storm.
- Is it lonely? Maybe. It is easier and safer for a bird to fly long distances as part of a flock.
- Are there any girl (female) cedar waxwings around our school? We have not seen any yet.
- If we put out berries, would more cedar waxwings come? This hasn't worked yet. Our feeders are out in the open and the waxwing may not feel safe.

\*We learned that cedar waxwings like fruit best, but sometimes also eat insects.

The group decided to make one more effort to feed the waxwing. As one second grader explained, “It’s sad that’s he’s lost from his flock and has to eat bugs and yucky juniper berries.” They moved their platform feeder to the edge of the woods where they most often spotted the bird. They added chopped apples and raisins and enforced a “quiet zone” along the end of the playground to help the waxwing feel safe. It worked! The waxwing began to visit every day to devour the fruit that children left for him.

One gray afternoon near the end of winter, a flock of other waxwings unexpectedly gathered in the trees around the feeding station. They swooped down to snack on raisins and apples. When the feeder was empty they flew away, and the lone cedar waxwing went with them.

The children revisited their web one, last time:



Even though the bird project was unexpected, Mr. Tyler found many creative ways to challenge children to communicate and figure things out. In addition to building, maintaining, and studying the bird feeding stations, children were often invited to try their hand at projects such as these:

- Can you make a map of the woods by our school? Include the cedar trees, stream, rock ledge, and glade.
- Write a story from the cedar waxwing’s perspective. How did he get separated from his flock?
- What if a masked bird was really a superhero? Draw a comic strip or write a story explaining its superpowers.
- If you could design a raccoon-proof bird feeder, what would it look like?
- Work with a team to make and illustrate a bird feeding guide with your best tips. We’ll copy the guides to share with teachers and families.

Children arrived each day eager to work together toward their shared goals. The project built a sense of community as the group collaborated over time to achieve a satisfying conclusion. Children deepened their knowledge about birds, and, more importantly, found many real world ways to use their academic and cognitive skills in satisfying ways.



Consider the following second and third grade objectives from the Arkansas Refrigerator Curriculum – goal lists designed for family members and others who support children outside of the traditional school day. As you reread the story of the bird project, consider how the bird study provided appealing ways for children to strengthen these skills:

### English Language Arts

2<sup>nd</sup> grade:

- Read texts about history, social studies, or science and identify main idea.
- Answer who, what, where, when, why, and how questions about stories and books to demonstrate understanding of key details.
- Participate in discussions by listening and building on what others say.
- Introduce a topic, use facts... to develop points, and provide a concluding statement.

3<sup>rd</sup> grade:

- Read texts to answer questions about history, social studies, or science.
- Refer to information from illustrations such as maps or pictures as well as words in text to support answers.
- Learn and use new vocabulary, including words related to specific subjects.
- Participate in discussions by listening, asking questions, sharing ideas, and building on the ideas of others.
- Gather information from books, articles, and online sources to learn more about a topic.

Teacher's note:

Our "hero bird" inspired all sorts of fact-finding. Children read field guides and studied maps and illustrations. Writing came into play when children wrote persuasive letters to their principal to propose the feeding stations. We also took notes, made charts, wrote stories, and made thank-you cards for our guest experts.

## Mathematics

2<sup>nd</sup> grade:

- Add and subtract...
- Skip-count by 5s, 10s, and 100s
- Solve addition, subtraction, and comparison problems using information presented in a bar graph.

3<sup>rd</sup> grade:

- Tell and write time intervals to the nearest minute and measure time intervals in minutes.
- Represent and interpret data on a picture graph and bar graph.

Teacher's note:

I've never seen a group get so excited about collecting data! My original proposal was to just record which kinds of birds came to our feeders. That didn't satisfy the children. They created a pretty complex system to record which birds went to which feeders. They also wanted to know what they ate and how long they stayed at the feeders. They ended up with a LOT of data to tally and sort.

## Science

2<sup>nd</sup> grade:

- Learn to ask questions about outside surroundings.
- Identify characteristics of mammals, birds, and fish.
- Identify natural resources.

3<sup>rd</sup> grade:

- Learn to ask questions about outside surroundings.
- Make predictions based on prior knowledge.
- Learn about living and extinct animals.

Teacher's note:

The children really seemed to relate to "their" bird. They worried about him when he was away and celebrated each time he returned. Their empathy for him seemed to motivate them to think much more deeply about the food, water, shelter, and space that animals need to survive.

## Social Studies

2<sup>nd</sup> grade:

- Locate countries bordering the U.S.
- Use cardinal directions.
- Understand and follow school, classroom, and community rules.

3<sup>rd</sup> grade:

- Know how to use a map legend/key.
- Use maps to identify continents, oceans, lakes, mountains, states, and cities.
- Learn how people in families, schools, and communities set rules and solve problems.

Teacher's note:

The children wanted to get started with creating feeding stations right away. They were disappointed when I told them that we couldn't make changes to school property without permission, but it turned out to be a really neat lesson about stating their case. The principal was pleased to hear what we were doing in the afterschool program and incredibly supportive.

A highlight of the whole project for me was the sense of teamwork that developed between the kids. Kids who don't usually play with one another became partners. Leaders emerged. Tasks were delegated. Plans were negotiated and successes were celebrated. It was really powerful to see our group come together like that.

Find out more about the Arkansas Refrigerator Curriculum by visiting [www.ArkansasEd.org](http://www.ArkansasEd.org)  
If accessing this article online, use the links below to view the Curriculum by grade level:

[Kindergarten](#)  
[First Grade](#)  
[Second Grade](#)  
[Third Grade](#)  
[Fourth Grade](#)

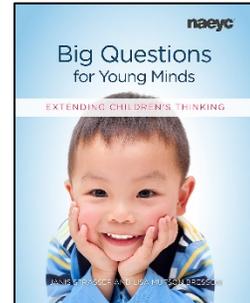
[Fifth Grade](#)  
[Sixth Grade](#)  
[Seventh Grade](#)  
[Eighth Grade](#)



# Recommended Reading

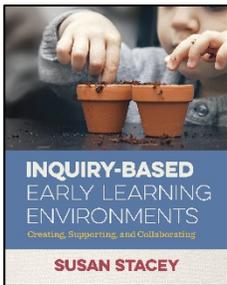
*Art of Leadership: Cultivating Curriculum in Early Childhood Organizations*  
Exchange Press, 2019

*Big Questions for Young Minds: Extending Children's Thinking*  
Janis Strasser and Lisa Muffson Bresson, NAEYC, 2017



*Children's Lively Minds: Schema Theory Made Visible*  
Deb Curtis and Nadia Jaboneta, Redleaf Press, 2019

*From Teaching to Thinking:  
A Pedagogy for Reimagining Our Work*  
Ann Pelo and Margie Carter, Exchange Press, 2019



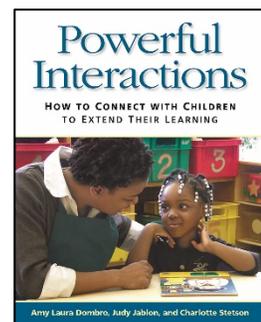
*Inquiry-Based Learning Environments: Creating, Supporting, and Collaborating*  
Susan Stacy, Redleaf Press, 2018

*Inquiry Mindset: Nurturing the Dreams, Wonders, and Curiosities of Our Youngest Learners* – focuses on K-1<sup>st</sup>  
Trevor MacKenzie with Rebecca Bathurst-Hunt, Elevate Books Edu, 2019

*The Language of Art: Inquiry-Based Studio Practices in Early Childhood*  
Ann Pelo, Redleaf Press, 2016

*Picturing the Project Approach*  
Yvonne Cogen, Sylvia Chard, and Carmen A. Castillo, Gryphon House, 2017

*Powerful Interactions: How to Connect with Children to Extend Their Learning*  
Amy Laura Dombro, Judy Jablon, and Charlotte Stetson, NAEYC, 2011



*Purposeful Play: A Teacher's Guide to Igniting Deep and Joyful Learning Across the Day* Kristine Mraz, Alison Porcelli, and Cheryl Tyler, Heinemann, 2016



*Rethinking the Classroom Landscape: Creating Environments that Connect Young Children, Families, and Communities*  
Sandra Duncan, Jody Martin, and Rebecca Kreth, Gryphon House, 2016



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## Childhood Services

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