During our many years working as teachers of young children, teacher educators, and colleagues offering professional activities together as Harvest Resources associates (www.ecetrainers.com), we have come to admire toddlers’ avid curiosity, determination, bigheartedness, and delight in engaging with people and the world around them. From our review of current research about the learning capacities of children under age 3, we realize that the eagerness toddlers have for almost every encounter is no accident, and we took it upon ourselves to study more about them.

Research confirms that during the toddler years children experience one of the most significant periods of development and learning. Children under age 3 have exceptionally flexible brains that allow them to hear more, see more, and experience more than adults. Their enhanced learning abilities reflect special features in their brains that make them more conscious than adults. They also innately approach learning in the same way scientists do, using the scientific method to experiment and analyze the results of what they discover. When toddlers use their brains well, through focused, sustained activity, their potential is enormous (Gopnik 2009).

Some materials limit exploration

Many times, the environments and materials offered to toddlers emphasize health and safety. While health and safety are important, an overemphasis on these features can limit the possibilities for richer experiences of exploration, collaboration, and learning. Some commonly
used materials provide few opportunities that engage children in the complex ways their lively minds deserve. Most toys chosen for use in child care settings have hard, plastic, unyielding surfaces that adults can easily sanitize. Toddler toys frequently teach simple concepts like color and shape or have a cause-and-effect component, such as a button or knob that beeps or lights up. Children might accidentally discover this feature or adults show them what it does. Once children figure out the minimal uses for these objects, there is not much else to challenge their lively minds.

Implied in the use of such materials may be the view of some educators that toddlers have limited capabilities or inner resources and require overstimulating experiences to stay interested in an activity or toy. Instead, what if we recognize and provide for toddlers’ dynamic brains and their capacity for seeing and using materials in boundless ways? What if, rather than thinking of materials as a way to teach the toddlers’ explorations of materials are filled with small actions during which they hear and see more than adults do. Because adults experience the world so differently (Gopnik 2009), seeing the significance of what toddlers are doing requires that we stop to notice the details of their actions and try to imagine what they might be thinking. To help cultivate our ability to see children’s minds at work, we offered a collection of natural materials—including shells, wood rounds, and stones in wooden bowls—to a group of toddlers.

We placed the materials on fabric and placemats to create a visual focus for the children. The materials gave the toddlers many possibilities for investigating texture, shape, color, size, weight, light, and sound. The toddlers manipulated the materials by dumping, filling, and transporting them. We carefully planned this experience, making sure we were with the toddlers for the entire activity to supervise for safety.

### Toddlers and sensory materials

**Toddlers’ explorations of materials**

Toddlers’ explorations of materials are filled with small actions during which they hear and see more than adults do. Because adults experience the world so differently (Gopnik 2009), seeing the significance of what toddlers are doing requires that we stop to notice the details of their actions and try to imagine what they might be thinking. To help cultivate our ability to see children’s minds at work, we offered a collection of natural materials—including shells, wood rounds, and stones in wooden bowls—to a group of toddlers. We placed the materials on fabric and placemats to create a visual focus for the children. The materials gave the toddlers many possibilities for investigating texture, shape, color, size, weight, light, and sound. The toddlers manipulated the materials by dumping, filling, and transporting them. We carefully planned this experience, making sure we were with the toddlers for the entire activity to supervise for safety.

### A lively mind at work

As we observed 19-month-old Javier, and later studied the photos of his explorations, we saw evidence of his flexible, scientific brain at work. Javier eagerly approached the materials, placing his entire hand inside a wooden bowl filled with stones, shells, and wood rounds. He carefully studied each of the objects. He touched the variety of natural objects and moved them into piles, perhaps noticing the similarities and differences of the items. With a look of wonder, Javier closely examined the stones he held in his hands. Next he tapped two stones together. His actions resulted in clicking sounds. Javier began to immerse himself in the materials as he placed objects on his head. He slid the stones down his face and dropped them back into the bowl.

Next Javier put an insect specimen encased in acrylic up to his eyes. We wondered if he was exploring its transparent and magnifying properties. Then Javier put the specimen block to his mouth and moved it around his lips, tongue, and teeth, perhaps exploring the texture, taste, and temperature that his other senses did not pick up.

Throughout this experience, Javier used all five senses and explored the materials in ways we never would have imagined. He seemed to have a purpose or question for every action he tried. We took his smallest actions seriously, and were impressed with his deep engagement with these objects. This motivated us to offer more possibilities for him to use his abilities to explore and learn.

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Calling on toddlers’ aesthetic sense

Javier’s meaningful engagement in exploring these materials moved us to expand our definition of sensory experiences, like water play and sand play, to include aesthetics. Webster’s Dictionary suggests that aesthetic comes from a Greek word meaning perception. Aesthetic development is a focused way of knowing and experiencing the world that involves engaging with the senses. Feelings, processes, and responses to objects and experiences are heightened, leading to an appreciation of the beauty found in the world and allowing us to become totally lost in the moment (Curtis & Carter 2008). This definition fit Javier’s investigations perfectly. Toddlers’ senses are highly attuned to taking in the sights, sounds, and movements that surround them. Why not take advantage of their enhanced abilities and design our environments to create more and varied opportunities for seeing and discovering the world? With toddlers’ aesthetic senses in mind, we now regularly add pleasing elements to our learning environments and find that the children engage with them enthusiastically.

Seeing schemas

As we continued to observe the details of children’s investigations with interesting materials, we saw more evidence of their active brains at work and we identified examples of actions related to other learning theories. The following observation is an example of children exploring schemas as identified by child psychologist Jean Piaget. A schema is a line of thought that is demonstrated by repeated actions and patterns in children’s play. These repeated actions suggest that this play is a reflection of inner and specifically directed thoughts. When children explore schemas, they are building on their understanding of abstract ideas, patterns, and concepts (van Wijk 2008). Here are some of the schemas Piaget identified as applied to a toddler (Piaget 1969):

- **Transporting**—Picks things up, moves things, puts things down, or dumps.
- **Transforming**—Uses materials to explore changes in shape, color, consistency, and such.
- **Trajectory**—Explores the horizontal, vertical, and diagonal movement of things and herself. Makes things fly through the air, moves her own body in these ways.
- **Rotation and circulation**—Experiments with things that turn, such as wheels and balls; explores curved lines and circles.
- **Enclosing and enveloping**—Surrounds objects with other things. Moves himself inside a defined area, like a ring of blocks or a box. Hides, covers, or wraps himself and other things.
- **Connecting**—Joins things together and ties things up.
- **Disconnecting**—Takes things apart, scatters pieces and parts (van Wijk 2008).

We offered the children a variety of materials, including balls, ramps, trays, and containers, to invite their investigation of schemas. The materials, although common, were not something we had offered to them before in this combination. Would the children be interested in these items? Would the small objects be safe for the children to use? Would the children throw the balls around wildly? Our concerns were...
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quickly put to rest when we witnessed the competence and focus the children brought to this experience.

The children walked into the room with confidence and quickly made their way to the carpet where we had set up the materials for play. Without directions or ideas from the adults, they discovered a multitude of possibilities the simple materials offered. For nearly an hour the children explored in the following ways:

- Noticed and repeated the many ways they could make sounds with the materials
- Negotiated various ways to fill and dump the containers and tubes
- Used the ramps and tubes to transport balls and other objects to various places in the room and to send them to a friend or a teacher
- Balanced the balls to move them back and forth between the tubes
- Rolled the balls rapidly down the ramps, concentrating on balancing them to keep them from flying off the ramps
- Manipulated the balls so they were spinning around and around on the trays
- Observed each other’s ideas and actions and imitated what they saw one another doing
- Tested new ideas as they observed other children’s actions, which caused their explorations to evolve, change, and grow more complicated

We were surprised when we realized that an hour had passed and the children remained immersed in the play. Our role was to observe their actions, narrate what we saw, and help them see each other’s actions. We were also there to supervise safe use of the materials, but we were surprised to note that none of us had to intervene in this way.

While watching the toddlers play, we realized that their actions—including some we previously prohibited—had a significance we had never noticed before. For example, because we understood that making things move and fly is the trajectory schema, we found ways to support the children’s work with the concept. When toddlers use their adaptable brains to explore, they are learning unlimited possibilities for how the world can be. They consider and act on countless unconventional ideas that can alarm or delight us. This is the gift young children bring to the world and to us. As they grow older they will put all they have discovered to use—to invent what has yet to be imagined or perhaps to solve the serious problems of our time (Gopnik 2009).

Principles for planning environments and choosing materials

Through our observations, we developed principles that we turn to again and again as we strive to ensure our practices engage children's capabilities (Curtis & Carter 2003).

**Offer materials in careful combinations and collections.** Find open-ended and unusual materials at unusual sources, such as garden stores, garage sales, or thrift stores. Here are some items to combine:

- Wooden trays, bowls, massage balls, spools
- Faux fur and fabric pieces with different colors and textures (soft, shaggy, sheer, shiny)
- Tubes, balls, and containers with lids
- Natural items, such as seashells, pinecones, rocks, gourds, dried flowers, twigs, and pods
- Coaster sets, napkin rings, hair curlers, paper towel tubes, and candle holders
- Light-reflecting and colorful objects (flashlights, color paddles, prisms, and other translucent, shiny objects)

**Explore materials for their possibilities before offering them to children.** This will help you see what the children may find engaging.

**Display materials in an orderly, enticing way.** Place them on a particular rug or mat to create a visual focus and to signify a time for play.

**Provide ample time and space for a small group (4 or 5 children) to play with the materials.** Don’t hurry or offer ideas too soon. Some children may need more time to begin their investigations or to see more possibilities. It is best if children work at their own pace and learn from each other.

**Sit nearby to supervise.** Be sure to take an interest in what the children are doing as they work.

**Offer descriptions and narrations of what you see unfolding.** What you give attention to supports children’s interests and communicates to them that their pursuits have value. Avoid dictating, controlling, or directing.

**Observe children to learn their interests and points of view.** Use these questions to guide your observations:

- What are the children drawn to about the materials—textures, shapes, colors, weight, size, or combinations?
- How do the materials support the children’s focus and purposeful actions so they stay with a particular investigation for an hour or more?
- How do the children manipulate the materials to learn about them? What actions reflect the children’s flexible brains and learning capabilities?
- What possible experiments and theories are the children working on?
Materials for Supervised Investigations

To enhance toddlers’ incredible potential, we plan experiences and offer materials for children to use when pursuing their instinctive and extensive approaches to learning. The following are examples of materials we offer toddlers for their supervised investigations:

- A collection of mirrors, metal containers, bracelets, jewels, and jewelry holders gives children opportunities to explore enclosing and enveloping, as well as rotation and circularity (experimenting with how things turn and spin); the mirrors’ reflections and the shiny objects appeal to children’s aesthetic sense

- Textured tiles and shiny wooden wedges encourage children to connect and disconnect the items in rows and lines, possibly using shape, color, and size as references

- Bamboo cove molding, plastic troughs, and balls, spools, and other objects that roll invite children to explore trajectory in a focused way

- Colorful bracelets, round containers with lids, and paper towel holders provide children with opportunities to explore rotation and circularity

- Colored water in small containers, pipettes, and ice cube trays invite children to explore transforming and transporting as they change the color of the water and move it from the bowls to the pipettes and then into ice cube trays

- Gak and Flubber (homemade), along with a wire rack, intrigue children when they discover their ability to transform these magical substances

Conclusion

When we offer meaningful materials to children and study the details of their actions to identify the significance they hold, we become intellectually engaged with children in their pursuits. We understand the role we play in providing vital materials and opportunities to explore and learn. Every day teachers witness complex learning and potential in the children they work with.

We invite you to offer a collection of unusual learning materials to toddlers. Notice the way they immerse themselves in the rich and magical world around them. Appreciate the flexible thinking and skills children use in their exploration and discovery. Share in the joy of being alert and alive. If we open ourselves to it, we learn from children to see and experience the world in new and wondrous ways!

References


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