

Spinning, Rolling, and Swinging: Investigating Balance with Infants and Toddlers

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WHY BALANCE WITH YOUNG CHILDREN?

Balance plays a role in nearly everything in our daily lives. It is a developmental skill that begins in infancy with sitting up, holding the body upright, crawling, and walking. Balance is a dynamic process involving the vestibular and proprioceptive systems that are in a constant need of adjustment as we grow. The vestibular system in our inner ear tells our brain if we are in or out of balance. The proprioceptive system helps us to coordinate our movements when engaged in motor activities that require balance. Balance is the foundation for many skills as we grow, influencing daily living, physical sports, and leisure activities. Children who struggle with balance may have difficulty understanding where their body is in space when seated in a chair, learning to ride a bike, or standing in a straight line. Infants and toddlers need high quality experiences that facilitate the development of balance.



Selecting high quality experiences in balance for infants and toddlers requires educators to use observation and documentation to determine the interests of children. Bess Gene Holt's (1980) useful model, "Distance from Self" assists educators in selecting physical and cognitive experiences that children may be most likely to find interesting and engaging. The closer an experience lies to children's personal ecology, the more relative it is to children. For infants and toddlers these are typically activities and materials they engage with at home and school, such as things they eat, pets and people who matter to them, and objects that they can grab, bang, throw, dump, pour, rattle, pound, and roll. Observation of infants and toddlers gives us a sense of how often they grapple with balance as they interact with their environment and learn about the world. As we watch children play with toys, climb into a chair, or learn how to navigate uneven surfaces on the playground, we can observe balance as an integral part of young children's personal ecology, and the STEM (science, technology, engineering, mathematics) within their experiences.

WHAT IS STEM FOR INFANTS AND TODDLERS?

NAEYC defines developmentally appropriate practice as "methods that promote each child's optimal development and learning through a strengths-based, play-based approach to joyful, engaged learning" (2020). STEM experiences tick all the boxes for a developmentally appropriate curriculum for infants and toddlers. Investigating balance is a STEM experience that engages children in all elements of STEM. Through observation, educators discover what infants and toddlers are naturally drawn to investigate and the kinds of problems they create for themselves. Children's investigations can be supported by providing time and opportunity for engaging with materials that allow them to independently produce an action that is immediate and observable and then to vary their actions for a different result. We find that planning STEM experiences that 1) begin closest to the child; 2) include objects and materials that are familiar and accessible; and 3) are presented in novel ways are the most engaging for infants and toddlers. Our definition of STEM for our youngest learners is based on our careful observations of what children from 0-3 do with materials and what we know about how children in this age group learn and interact with their environment.



Science: exploring materials; making predictions based on observations; reflecting on the investigation; sharing the discoveries; trying again when the first attempt is unsuccessful.

Technology: using familiar materials in new and interesting ways; identifying problems and creatively seeking their solutions; learning to use tools; making things work.

Engineering: solving problems; using a variety of materials; designing and creating solutions; building things that work.

Mathematics: exploring space and how things fit or don't fit, including bodies and body parts; a way of measuring, sequencing, and patterning; exploring, identifying, and describing attributes, comparing (size/weight/volume/height/distance).

We also consider the child's active role in the experience and evaluate STEM experiences to ensure that they include what we refer to as PIOV:

- 1) the child must be able to **produce** an action themselves
- 2) the result of that action is **immediate**
- 3) the result must be **observable** by the child
- 4) there is something for the young learner to **vary** and try again (Counsell et al., 2015)

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HOW DO INFANTS AND TODDLERS ENGAGE IN INQUIRY LEARNING?

A simple definition of *inquiry* is looking for information. Inquiry for an infant or toddler begins when the child notices something that is intriguing, surprising, or stimulates a question. The *Infant Toddler Inquiry Learning Model* is a way to think about how very young children best learn through exploratory experiences as they engage with the world. When adults observe and think about children's actions as they explore, they can more clearly understand how to support their learning. Ample time and supportive adult interactions encourage children to solve the problems they find, without the adults providing problems or solutions.

Infant Toddler Inquiry Learning Model



WONDER

- Investigate materials
- Use familiar strategies to explore physical characteristics of materials

RESOLVE

- Satisfaction with the exploration and actions taken
- Acceptance of a solution to the identified problem
- Repetition of the successful activity
- Demonstration for others

STRATEGIZE

- Discover or create a problem to be solved
- Combine old or new strategies to investigate materials and their interaction
- Create
- Observe how materials and actions work or don't work
- Try again

Infants and toddlers move freely among **WONDER**, **RESOLVE**, and **STRATEGIZE** as they engage with open-ended materials such as those used in balance activities. As they handle and explore these materials, they construct physical and logical-mathematical knowledge and reflect on what they have experienced. In this inquiry they may do any of the following in no certain order:

act on an object
repeat an action
try a new strategy
stop to think a while

leave the investigation for a time then return
revisit the problem with new strategies
revisit the problem with additional materials
try new strategies

The inquiry process continues until the child reaches a resolution that is acceptable to them, or until the child's resolution is to leave the problem behind. This model describes a kind of *free inquiry* that is not linear, indicated by the overlapping circles in the model.

THE TEACHER'S ROLE

In inquiry learning environments, educators conduct their own inquiry to plan rich experiences for young children. Inquiry teaching promotes planning opportunities for infants and toddlers to engage in experiences that encourage problem solving, curiosity, question formation, and exploring the world around them. Children's engagement in inquiry learning experiences satisfies their desire to discover or create problems to investigate. Even though infants and toddlers may not verbalize their questions, they still have questions as they try to understand how the world works (Greenfield et al., 2017). When teachers take time to reflect on their observations and documentation of children, they can identify interests and plan experiences that support children's specific questions.

While it is essential for educators to plan the environment, select materials carefully, and manage the daily schedule with intent, it is equally important for them to follow the child's lead in adult-child interactions during play routines. When adults maximize opportunities for back-and-forth exchanges with young children, inquiry learning opportunities can be embedded throughout the day. These every day activities can easily include STEM components when adults plan with intention. In addition, careful observation will reveal that many children's activities already include STEM components—we just need to recognize them.

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While we certainly encourage careful planning for STEM experiences, we also acknowledge that **unplanned opportunities can often be the learning experiences with the greatest impact.**

DESIGNING AN INFANT TODDLER BALANCE EXPERIENCE

Designing STEM experiences for infants and toddlers requires educators to think differently about the planning process – by planning **experiences rather than lessons**. Experiences with open-ended materials happen over time rather than in a single play period. With observation and reflection, educators can determine the interests of young children and plan experiences based on these observations. As we continue to observe and reflect, we can determine when children need additional materials or when they are ready for a new challenge. Time is also a factor when toddlers appear to leave an experience but will return to it if materials are still available. When open-ended materials are selected based on knowledge about the children who will explore them, infants and toddlers will engage with them for extended periods of time. STEM investigations happen naturally when high quality materials are at the fingertips of children throughout the day. Planning specific times in the day to work with children in small groups or one-on-one can assist educators with formative assessments that will provide important information for planning and communicating with families.

SELECTING MATERIALS

Experienced infant toddler educators understand that children in this age group engage willingly with any new materials. When they plan based on their knowledge about the children in their care, they can provide materials that invite exploration and encourage learning. Young infants are limited in their ability to explore unless educators place materials within view or reach. Toddlers will explore any new materials they see within the environment. Educators can devise a simple system for documenting what they notice as children explore the new materials. When children do not engage with the materials or use them inappropriately, adults can support them by moving into the area, asking simple questions, and making comments. Some children may need more specific guidance such as modeling ways of using the materials or combining them in new and interesting ways. Some children will model what peers are doing before finding their own problems to solve. Careful observation will guide educators to add new materials or remove others that are no longer of interest.

Suggested materials for investigating balance with infants (birth-12 months)

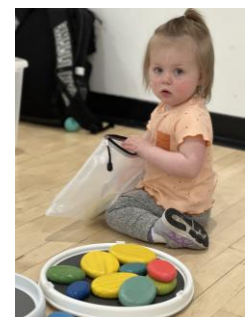
- Treasure baskets with materials that balance, stack, and nest
- Found materials that can be balanced, stacked, and toppled
- Toys that stack, nest, balance, rock, and fall
- Lazy Susans
- Mini-unit blocks
- Target ball with plastic cups, balls, and bean bags
- Large tops



Suggested materials for investigating balance with young toddlers (12-24 months)



- Found materials that can be balanced, stacked, and toppled
- Toys that stack, nest, balance, rock, and fall
- Mini-unit blocks
- Stacking stones
- Target ball with cardboard blocks, balls, and bean bags
- Lazy Susans
- Sit & Spins, Bilbos, therapy balls, rocking boards
- Materials the children found
- Variety of tops



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Suggested materials for investigating balance with older toddlers (24-36 months)

- Found materials that can be balanced or stacked (and toppled)
- Mini-unit blocks
- Stacking stones of various sizes
- Target ball with cardboard blocks, balls, and bean bags
- Lazy Susans with stacking stones and small blocks
- Sit & Spins, Bilbos, rocking boards, therapy balls
- Walking on lines
- Left-right balance materials
- Variety of tops
- Hula hoops



ASSESSMENT

Some infant toddler educators work in programs that require specific assessments several times throughout the year. For most educators who work with children in this age group there is little or no assessment required other than the daily information to parents regarding meals, sleep, and diapering. Some programs have adopted apps that provide parents with ongoing information about daily routines as well as photos of children engaged in activities. A few of these apps include assessment and documentation opportunities as well as developmental checklists to help parents in understanding what to expect at each stage of development.

In other programs, educators use pedagogical documentation in the form of Learning Stories (Carr, 2001), documentation panels, or portfolios that capture specific moments in the life of the child and the classroom. "Pedagogical documentation is about more than recording events – it is a means to learning about how children think and learn" (2014, 21). Pedagogical documentation makes learning visible and invites the interpretation of others who view the documentation. This can include families, administrators, and the children themselves as they view the documentation in whatever form it takes. Experts in this kind of assessment suggest that it is everyday moments that should be captured rather than special events (Kashin, 2015). Imagine the power of sharing your learning journey with others in your school community!

PUTTING IT ALL TOGETHER

Balance experiences can be offered throughout the year to explore all the possibilities for learning. Careful observation of children will guide educators who work with infants and toddlers to capitalize on their interest in balancing their own bodies and supporting them by offering them new materials that require them to grapple with balance. Engaging infants and toddlers in balance experiences provides endless opportunities for them to solve interesting problems that they pose for themselves and to engage in experiences that help to learn about their world and how it works. Infant and toddler educators can expand their understanding of balance in their lives by exploring materials themselves, including how their own bodies engage in balance activities, and how they automatically correct imbalances.

REFERENCES

- Boston Children's Museum. (2013). Brain building for STEM. STEM sprouts: Science, technology, engineering & math teaching guide. Author. Retrieved from [STEMGuide.pdf](#) (bostonchildrensmuseum.org).
- Carr, M & Lee, W. (2019). *Learning stories in practice*. Thousand Oaks, CA: Sage.
- Counsel, S. et al. (2016). *STEM Learning with young children: Inquiry teaching with ramps and pathways*. New York: Teachers College Press.
- Greenfield, D. B., Alexander, A., & Frechette, E. (2017). Unleashing the power of science in early childhood: A foundation for high quality interactions and learning. *Zero to Three*, 37(5), 13-21.
- Kashin, D. (2015). Pedagogical Documentation: Why? When? Who? What? Where? How? Retrieved from <https://tecribresearch.blog/2015/05/17/pedagogical-documentation-why-when-who-what-where-how/>
- NAEYC. 2020. "Developmentally Appropriate Practice." Position statement. Washington, DC: NAEYC. <https://www.naeyc.org/resources/position-statements/dap/contents>
- Ontario's Pedagogy for the Early Years. (2014). How does learning happen? Retrieved from <https://files.ontario.ca/edu-how-does-learning-happen-en-2021-03-23.pdf>
- Holt, B. G. (1977). *Science With Young Children*. Washington, DC: NAEYC.
- VanMeeteren, B., & Peterson, S. (2021). *Investigating STEM With Infants and Toddlers*. New York, NY: Teachers College Press.