

2017-2018 Teacher Time for Preschool Teachers—Episode 3
Viewers Guide

Cognitive Development for Preschoolers: Geometry and Spatial Sense

<p>Summary:</p>	<p>Paul Halmos, an influential mathematician once said, “The only way to learn mathematics is to do mathematics.” This is especially true for those who may not be confident in their math skills. The best way to tackle this challenge is to face it — the only way to learn math is to do it! Research tells us that early math skills predict later math skills—and that early math skills may be better predictors of academic success than early literacy skills! Additionally, the more math-related activities children do before Kindergarten, the better they will understand math in school.</p> <p>Episode 3 digs a little deeper into how you can support preschoolers’ development of geometry and spatial sense, an important part of early cognitive development as described in the Head Start Early Learning Outcomes Framework (ELOF).</p>
<p>Today’s Topic and Guest Expert</p>	<p>Geometry and Spatial Sense</p> <p>Cognition, or cognitive development, includes reasoning, memory, problem-solving, and thinking skills. Young children use these abilities to make sense of and organize their world. From birth and especially in the preschool years, mathematics includes and can support the development of all these competencies. They can engage in complex mathematical thinking and scientific reasoning. In the ELOF, one of the Cognition sub-domains is Geometry and Spatial Reasoning.</p> <p>Guest expert, Dr. Doug Clements, shares some information to inform our understanding of early math development.</p> <ul style="list-style-type: none"> • Children’s understanding about shapes and spatial relations grows rapidly during the preschool years. • Their ability to recognize shapes regardless of orientation continues to develop. • Spatial concepts and use of spatial language becomes increasingly sophisticated. • Playing and manipulating objects and toys highlight the relationship between spatial sense and geometry. • Children move from a trial-and-error approach to more planned, deliberate actions. <p>NOTES: What are some ways your learning environment supports early math learning?</p>

<p>Videos and Guest Expert</p>	<p>As a teacher you support children’s development of geometry and spatial sense through indirect instruction like fun music and movement games or by setting up an obstacle course on the playground — allowing children the space to explore the movement and positioning of their bodies or objects in their world.</p> <p>Dr. Clements offers suggestions for effective practices that support geometry and spatial sense.</p> <p>NOTES: What are some strategies mentioned by Dr. Clements that you would like to try?</p>
<p>Teacher Videos and Chat</p>	<p>You watched videos of teachers supporting children’s development of geometry and spatial sense.</p> <p>NOTES: What strategies stood out for you? What did you notice about how the children responded?</p>

Approaches to Learning	<p>Approaches to learning focuses on <i>how</i> children learn, rather than <i>what</i> they learn. This domain describes the skills and behaviors that children use to learn. This domain also includes initiative, curiosity, and creativity. When using these skills, children learn to do things that are challenging, frustrating, or simply take time to do.</p> <p>Some of the important goals for children in Approaches to Learning are to persist in a task, demonstrate flexibility about thinking, and use imagination in play and interactions with others. Some way that children can meet these goals within the context of geometry and spatial sense are:</p> <ul style="list-style-type: none">• Children learn to persist in challenging tasks, like puzzles, even when it is frustrating• Preschoolers become more flexible in their thinking and are able understand that shapes can take on different forms• Children use their imaginations and spatial sense when climbing on structures or building castles <p>NOTES: How do you create an environment that lets children know they are safe to explore and learn?</p>

<p>Ongoing Assessment</p>	<p>Observing and documenting growth in children’s emergent mathematical thinking requires <i>focused observation</i> and <i>intentional engagement</i> with children.</p> <p>Teachers can use a variety of methods to assess children’s early math skills including observations, checklists, anecdotal notes, frequency counts, and children’s work samples.</p> <p>Engage in ongoing two-way communication with families about children’s exposure to and experiences with math concepts at home—as well as the language(s) children are hearing/understanding/using at home. Observe for spatial or shape awareness skills that children demonstrate and can be assessed even with a language barrier. This will help you better assess children’s emergent mathematical thinking.</p> <p>NOTES: What are some early math skills you want to intentionally observe for this week?</p>
<p>Questions and Answers with Hosts</p>	<p>NOTES: What is a new activity you learned that will help you integrate math and spatial sense in your daily curriculum?</p>

<p>Wrap Up & Resources</p>	<p>Early Childhood Learning and Knowledge Center (ECLKC) https://eclkc.ohs.acf.hhs.gov/</p> <ul style="list-style-type: none"> • Effective Practice Guides: Cognition – https://eclkc.ohs.acf.hhs.gov/school-readiness/effective-practice-guides/cognition • Effective Practice Guides: Geometry and Spatial Sense – https://eclkc.ohs.acf.hhs.gov/school-readiness/effective-practice-guides/geometry-spatial-sense • Science and Math in Preschool Curriculum: Can all young children benefit? – https://eclkc.ohs.acf.hhs.gov/video/science-math-preschool-curriculum-can-all-young-children-benefit • High Five Mathematize – https://eclkc.ohs.acf.hhs.gov/publication/high-five-mathematize • Text4Teachers – https://eclkc.ohs.acf.hhs.gov/teaching-practices/article/text4teachers • Understanding STEAM and how children use it – https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/steam-ipdf.pdf • Teaching and Learning with <i>Learning Trajectories</i> (LT²) – https://www.learningtrajectories.org/ • Teacher Time Series: Preschool math ideas hiding in plain sight https://eclkc.ohs.acf.hhs.gov/teaching-practices/teacher-time-series/preschool-math-ideas-hiding-plain-sight • Zero to Three early math videos (focuses on ages birth to five) <ul style="list-style-type: none"> ○ Everyday Fun With Spatial Awareness: Let’s Talk About Math – https://www.zerotothree.org/resources/251-everyday-fun-with-spatial-awareness-let-s-talk-about-math-video ○ Everyday Fun With Shapes: Let’s Talk About Math – https://www.zerotothree.org/resources/250-everyday-fun-with-shapes-let-s-talk-about-math-video • Support Math Readiness Through Math Talk (Eugene Geist, NAEYC) – https://families.naeyc.org/learning-and-development/music-math-more/support-math-readiness-through-math-talk

	<ul style="list-style-type: none"> • Math is for everyone: Strategies for supporting early mathematical competencies in young children — http://ocw.umb.edu/early-education-development/eec-preschool-learning-standards-and-guidelines/ple-math-module-readings/Math%20is%20for%20Everyone.pdf/at_download/file.pdf <p>Head Start Early Learning Outcomes Framework (ELOF) https://eclkc.ohs.acf.hhs.gov/school-readiness/article/head-start-early-learning-outcomes-framework</p> <ul style="list-style-type: none"> • There’s the ELOF for That (video) • ELOF Interactive Framework • ELOF2GO Mobile App • Effective Practice Guides <p>MyPeers https://eclkc.ohs.acf.hhs.gov/about-us/article/mypeers-collaborative-platform-early-care-education-community</p>
<p>Head Start Program Performance Standards</p>	<p>Information in this episode reflects the following Head Start Program Performance Standards:</p> <p>§1302.31 Teaching and the learning environment</p> <p>(b) Effective teaching practices</p> <p>(1) Teaching practices must:</p> <ul style="list-style-type: none"> (i) Emphasize nurturing and responsive practices, interactions, and environments... (ii) Focus on promoting growth in the developmental progressions described in the Head Start Early Learning Outcomes Framework... (iii) Integrate child assessment data in individual and group planning; and (iv) Include developmentally appropriate learning experiences in language, literacy, social and emotional development, math, science, social studies, creative arts, and physical development... <p>(2) For dual language learners, a program must recognize bilingualism and biliteracy as strengths and implement research-based teaching practices that support their development. These practices must:</p> <ul style="list-style-type: none"> (i) For an infant or toddler dual language learner, include teaching practices that focus on the development of the home language, when there is a teacher with appropriate language competency, and experiences that expose the child to English <p>(c) Learning environment</p> <p>(1) For infants and toddlers, promote relational learning and include individualized and small group activities that integrate appropriate daily routines into a flexible schedule of learning experiences.</p> <p>§1302.33 Child screenings and assessment</p> <p>(c) Characteristics of screening and assessment</p>

- (2) If a program serves a child who speaks a language other than English, a program must use qualified bilingual staff, contractor, or consultant to:
- (i) Assess language skills in English and in the child's home language, to assess both the child's progress in the home language and in English language acquisition;
 - (ii) Conduct...assessments for domains other than language skills in the language or languages that best capture the child's development and skills in the specific domain;

Subpart F—Additional Services for Children with Disabilities

§1302.60 Full participation in program services and activities

A program must ensure enrolled children with disabilities...receive all applicable program services...and that they fully participate in all program activities.