WEB RESOURCES

Boucher, D. 2011. "Subitizing: Moving from perceptual to conceptual." *http://www.mathcoachscorner.com/2016/07/subitizing-moving-from-perceptual-to-conceptual/*.

This online article describes perceptual and conceptual subitizing and includes tips for teaching subitizing. It also has links to subitizing games and activities.

Clements, D. H., & J. Sarama. 2018. "Learning and Teaching with Learning Trajectories (LT2)." *http://LearningTrajectories.org*.

This free website has a full learning trajectory for number recognition and subitizing (as well as other topics). It includes information about subitizing and why it is important, the learning path most children follow as they learn number recognition and subitizing, and educational activities to help children at each level build their understanding and skill. It also includes software based on research in entertaining contexts that helps children moves through the levels.

Clements, D. H. & J. Sarama. 2017. "Learning Trajectories/Teaching Strategies Gold Alignment." *https://www.learningtrajectories.org/system/files/inline-files/TSG%20Alignment%20with%20LTs.pdf*.

This handout aligns Teaching Strategies Gold to Learning Trajectories.

Early Head Start National Resource Center. 2012. "News You Can Use: Supporting Early Math Learning for Infants and Toddlers." Early Childhood Learning & Knowledge Center. *https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/nycu-early-math-learning.pdf*.

This article provides ways to recognize and support early math learning for infants and toddlers including ways to engage families in helping children development math skills.

Erikson Institution. 2018. "Topic: Subitizing." *http://earlymath.erikson.edu/tag/subitizing/*.

This website has links to information on teaching and activities for subitizing. The links contain both written articles with information and video examples and instructions.

International Traditional Games Society. 2016. "Native Games of Montana Tribes." *https://www.traditionalnativegames.org/games-flip-book*.

This flip booklet contains traditional games to play with all ages, from youth to elders. Use them in tribal programs to teach values such as respecting your competitors and being humble even when winning.

National Center on Early Childhood Development, Teaching, and Learning. 2018. "Effective Practice Guides: Emergent Mathematical Thinking." Early Childhood Learning & Knowledge Center. *https://eclkc.ohs.acf.hhs.gov/school-readiness/effective-practice-guides/emergent-mathematical-thinking*.

This effective practice guide provides information about mathematical teaching practices that support children's development. The guides show what these practices look like in early learning settings. They also help staff reflect on and improve their teaching practices

National Center on Early Childhood Development, Teaching, and Learning. 2017. "Making It Work: Implementing Cultural Learning Experiences in American Indian and Alaska Native Early Learning Settings." Office of Head Start, Early Childhood Learning & Knowledge Center. *https://eclkc.ohs.acf.hhs.gov/culture-language/article/making-it-work-implementing-cultural-learning-experiences-american-indian*.

Making It Work is a suite of products that helps AIAN programs connect traditional cultural skills, values, beliefs, and lifeways to early childhood development and school readiness goals while involving families and community in the process.

This document was developed with funds from Grant #90HC0012 for the U.S. Department of Health and Human Services, Administration for Children and Families, Office of Head Start, and the Office of Child Care by the National Center on Early Childhood Development, Teaching, and Learning.

National Center on Early Childhood Development, Teaching, and Learning. 2018. "Implementing Cultural Learning Experiences in AIAN Settings: A Webinar on Making It Work." Office of Head Start, Early Childhood Learning & Knowledge Center. *https://eclkc.ohs.acf.hhs.gov/video/implementing-cultural-learning-experiences-aian-settings-webinar-making-it-work*.

Discover the importance of language and culture in American Indian and Alaska Native (AIAN) early learning programs. Making It Work is a guide for implementing cultural learning experiences. It is also used to foster children's development across the Head Start Early Learning Outcomes Framework (ELOF) domains. Hear from AIAN staff about how their traditional values and practices are at the center of their programs.

National Council of Teachers of Mathematics. *https://www.nctm.org/*.

This council is the largest mathematics education organization in the United States and Canada. The council advocates for high-quality mathematics teaching and learning for all students. Read research articles, find out about conferences, and learn about best math practices in the classroom.

National Head Start Family Literacy Center. 2010. "High Five Mathematize." Early Childhood Learning & Knowledge Center. *https://eclkc.ohs.acf.hhs.gov/publication/high-five-mathematize*.

High Five Mathematize is an Early Head Start and Head Start math resource that promotes teaching math concepts through children's play and everyday experiences by bringing out the math in what they are doing. The guide uses professional development resources and tools to promote high quality math education.

"Revisiting and Updating the Multicultural Principles for Head Start Programs Serving Children Ages Birth to Five." *https://eclkc.ohs.acf.hhs.gov/culture-language/article/multicultural-principles-early-childhood-leaders*.

This resource is divided into 10 chapters. Each chapter presents one multicultural principle, the research and guidance to support that principle, and questions or discussion activities.

National Center on Early Childhood Development, Teaching, and Learning. "Engaging Interactions and Environments." Office of Head Start Early Childhood Learning & Knowledge Center. *https://eclkc.ohs.acf.hhs.gov/teaching-practices/article/engaging-interactions-environments*.

These 15-minute In-service Suites are professional development resources for staff in busy, active early childhood centers and programs. Each focuses on one topic or big idea and addresses effective teaching and assessment practices.

U.S. Department of Health and Human Services, Administration for Children and Families. 2015. "Native Language Preservation, Revitalization, Restoration, and Maintenance in Head Start and Early Head Start Programs ACF-IM-15-02." *https://eclkc.ohs.acf.hhs.gov/policy/im/acf-im-hs-15-02*.

This Information Memorandum (IM) clarifies the Office of Head Start's (OHS) support for teaching tribal languages to children in AIAN Head Start and Early Head Start.

National Center on Cultural and Linguistic Responsiveness. 2012. "Office of Head Start Head Start Cultural and Linguistic Responsiveness Resource Catalogue Volume Two: Native and Heritage Language Preservation, Revitalization, and Maintenance (Second Edition)." *https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/resource-catalogue-main-book-4.pdf*.

This resource supports Head Start programs working to preserve, revitalize, and reclaim American Indian, Alaska Native, Pacific Island, and other heritage languages. Catalogue entries showcase resources and practices on topics such as early childhood language nests, the use of technology in language learning, immersion preschool programs, and culturally responsive curricula.

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VIDEOS

If you are interested in viewing videos of children's development and activities that support subitizing, *https://www.learningtrajectories.org/* houses many videos that show viewers what each developmental step looks like for perceptual and conceptual subitizers, as well as many other areas of math development and learning. This free web resource also includes instructional activities for small and whole groups. The following videos are samples from the Learning and Teaching with Learning Trajectories Website.

Perceptual Subitizer. *https://www.learningtrajectories.org/video/5159*.

This video is an example of perceptual subitizing. The child quickly subitizes three grapes and one grape.

Conceptual Subitizer. *https://www.learningtrajectories.org/video/2846*.

This video is an example of conceptual subitizing. The child quickly names two groups as five in two different arrangements.

Number Me Instructional Video. *https://www.learningtrajectories.org/video/6900*.

This is an instructional video where the teacher leads the children through an activity naming how many of a specific body part they have, such as one nose or two arms.

Math and the Preschool Child: High Five Mathematize.
https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/nycu-early-math-learning.pdf.

This webinar describes how to help teachers bring out the math in children's everyday activities. It also reviews resources and tools to help supervisors support teaching staff in four areas: numbers and operations, geometry and spatial sense, patterns, and measurement.

Preschool Math Ideas: Hiding in Plain Sight.
https://eclkc.ohs.acf.hhs.gov/teaching-practices/teacher-time-series/preschool-math-ideas-hiding-plain-sight.

Learn about the many ways to teach math through children's daily learning activities and environments, including storybooks. Watch videos of teachers in action, using math and science in their classrooms. Presenters introduce the concept of mathematizing—noticing, bringing out, and talking about the math that's all around us.

BOOKS

Clements, D. H., & J. Sarama. 2014. *Learning and Teaching Early Math: The Learning Trajectories Approach*. New York, NY: Routledge.

This book describes the learning trajectory approach to teaching young children mathematics. Chapter 2 specifically deals with number, counting, and subitizing. It describes developmental progression and activities at each level.

ARTICLES

Clements, D. H. 1999. "Subitizing: What is It? Why Teach It?" *Teaching Children Mathematics* 5 (7): 400-405. *http://gseweb.gse.buffalo.edu/fas/clements/files/Subitizing.pdf*.

This article describes the history of subitizing and the two types of subitizing—perceptual and conceptual. It includes implications for teaching conceptual subitizing and number recognition as well as conceptual subitizing and arithmetic.

Conderman, G., M. Jung, & P. Hartman. 2014. "Subitizing and Early Mathematics Standards: A Winning Combination." *Kappa Delta Pi Record* 50 (1): 18-23.

This article defines subitizing and shares why it is important. It shares ways to include subitizing in math curriculum. The article lists Common Core and NCTM Standards and includes subitizing activities that align with the standards.

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