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| Early Math Matters: Preparing Preschoolers to Succeed |
| *By Kristin Stanberry*  For preschoolers in the United States, the pressure is on to learn math early and learn it well. The No Child Left Behind Act (NCLB) has put pressure on schools to make sure that all students are meeting state standards for achievement, and this has resulted in more rigorous math curricula and testing, starting in early elementary school. With increased public attention on the value of high-quality early childhood education, the pressure to perform has trickled down to our youngest students, and preschools are taking a closer look at their math programs and making adjustments that will prepare “little learners” for the challenges of elementary school. And parents are always searching for better ways to boost their youngsters’ mastery of early math.  Sound overwhelming? It’s a tall order, to be sure. We can start by learning from some of the research studies on early math acquisition. And we must understand and respect how preschool students naturally explore and experiment with math concepts; with this insight, we can identify effective math programs and tailor experiences and instruction that will propel them towards success. Finally, math is best taught at both home and at school. Parents and teachers can work together to make math a fun part of every preschooler’s day.  **The many dimensions of math**  Even for young children, math is more than just a numbers game. Math has many dimensions, including:   * **Number sense** (e.g., the numeral “4” represents four objects, which is greater that 3 and less than 5) * **Geometry** (e.g., patterns and shapes, each with unique features) * **Measurement** (e.g., size, distance, amount) * **The language of math** (e.g., more than, less than, equal to) * **Spatial relations** (e.g., in front of or behind; near or far)   Watch a young child — at home or in the preschool classroom — and, over the course of a day, you’ll likely be surprised at the number of ways that math is expressed, in words and in actions.  **Preschoolers learn math by exploring their world**  Much attention and research has been focused on early reading over the past few decades and researchers are now catching up to learn more about early math learning and instruction. What they’ve learned so far is intriguing. For example, researchers have found that young children are, by nature, curious about math. They have good evidence that math becomes real to young children as they use it by talking, reasoning, playing, and doing. And, they have a better understanding of how preschoolers’ early exploration of math helps them make sense of their world and what kinds of instruction and practice are needed to help them build new skills and deepen their knowledge.  One somewhat surprising research finding is that preschoolers appear to learn math concepts and operations in a much less predictable sequence than they do when learning to read. Most young children acquire reading awareness and skills in a fairly linear fashion. Think of it this way: Imagine a tower of blocks, with necessary skills — like print awareness — providing a foundation on which to build other skills — like phonemic awareness. Early math learning, on the other hand, is more like assembling a jigsaw puzzle, with children mastering math concepts in no set sequence but still managing to assemble the complete picture over time. While there is no agreed-upon continuum for learning early math, researchers have identified areas of math learning with specific “growth points” that young children achieve as they become more skilled math learners . (These findings are based on the work of the National Mathematics Advisory Panel and the Early Childhood Mathematics project of the National Academy of Sciences.)  **Gauging a preschooler’s grasp of math**  Preschoolers may learn about math through a variety of pathways, but by age 3 or 4 a child should have a good grasp of certain math concepts and be able to perform basic math operations. Keep in mind that a child may be strong in some aspects of math but have difficulty with others. Some math skills and operations call upon “non-math” skills, such as reading text, fine motor skills, and memory. Be sure to consider all of your child’s academic strengths and weaknesses when searching for the root cause of a possible math problem. Preschool teachers should use basic math assessment techniques to determine a baseline for the student’s math literacy level; doing so will help inform decisions about what to teach and how to monitor progress. And parents should be invited (and encouraged) to share with the teacher what they know about their child’s basic math abilities and attitudes.  At this time, researchers haven’t been able to clearly identify the core deficits that explain math disabilities in preschool students. While this can make screening and assessment in math tricky, it’s still wise to seek help and additional support for children who display possible signs of a [learning disability or delay in math](http://www.getreadytoread.org/early-learning-childhood-basics/early-math/early-math-matters-a-guide-for-parents-of-preschoolers)**.**  **The power of a good preschool math program**  As states revamp their preschool math program requirements and schools look to strengthen math instruction for students across the grades, parents and educators can play an important role in ensuring that practices that have proven to be effective in promoting math learning are in place:   * **Collect baseline information.** Know what concepts and skills a child has already learned so that an effective program of instruction and support can be designed and implemented early in the preschool year. * **Children will need different types of instruction and support.** Teachers will want to meet students “where they are” and tailor instruction to build on the individual child’s knowledge and ability. * **Make math real.** Be sure to reinforce and practice math learning throughout the day, in school, at home, and in the community. * **Learn math by living math.** Focus less on passive learning (such as listening to someone explain and demonstrate), and provide lots of hands-on activities. Young children (and older ones too!) learn by doing. * **Forge parent-teacher partnerships.** Many parents aren’t sure how to teach their preschoolers math at home. Use parent-teacher conferences to discuss strategies that have been successful in the classroom and talk about how these can be reinforced in everyday games and activities at home. * **Show me the research!** Ask why the school uses a particular approach or set of activities to teach math, and ask whether it is based on the best available research.   **Math across the curriculum and throughout life**  Math is often treated as a one-dimensional subject that is separate from other subjects taught in school. Unfortunately, this is a common (sometimes unconscious) perspective among adults, including preschool teachers and parents. As a result, many preschoolers come to view math as something that has no connection to other school activities or to their daily lives. Adults can correct this kind of “disconnect” by:   * becoming more aware of how math is part of their personal and professional lives; * blending math instruction with other subjects (e.g., reading a story that involves counting in some way); * broadening the teaching of math to include activities at home and in the community.   Another obstacle to teaching math to preschoolers is that many parents and teachers lack confidence in math, and some even suffer from math anxiety. Children often have an uncanny ability to sense an adult’s comfort with — or aversion to — certain things, and math is no exception. Parents don’t have to be math experts to help their children, and teachers, especially in the early years, can build a curriculum that both meets their comfort level and addresses the needs of their students.  **Parents + teachers = A winning team**  Parents and teachers should work together to assure that each child is learning the many aspects of math – in the classroom, at home, and in the community. Building on a child’s natural interest in math is key, as is monitoring a child’s progress and making adjustments in instruction to address difficulties in understanding and mastering early math concepts. There’s every reason to believe that today’s preschoolers can grow up to understand, experience and appreciate math in a broader and more practical context than the generations before them. We’re counting on it!  *Kristin Stanberry is a writer and editor specializing in parenting, education, and consumer health/wellness issues. Her areas of expertise include learning disabilities and AD/HD, topics which she wrote about extensively for Schwab Learning and* [*GreatSchools*](http://www.greatschools.org/)*.* |