

Unit 3 Research



Research supports the importance of incorporating learning centers into the curriculum for successful mathematics achievement.⁽¹⁾ Integrating math into other parts of the day, especially during learning center time, makes math meaningful and provides opportunities for children to practice what they have learned in a purposeful manner. When teachers coordinate their current math objectives with activities in the classroom, children reinforce their skills.⁽²⁾ For instance, math games for learning centers in the Starfall classroom have been created to match current math objectives. These games build on children's math knowledge, provide a reason for learning skills and concepts, and supply repeated practice that is fun. Math games were found to have a positive influence on young children and their learning. A group of studies found that children who played number-based board games performed better in the domain of basic number concepts than those who played other types of board games or no board games.⁽³⁾

Math learning centers give children and teachers an opportunity to discuss strategies and ideas and generate excitement. The arrangement of construction materials (connect cubes, dice, dominoes, tiles, play dough, etc.) in learning centers encourages children to match and sort by color, shape, size, and other features, to count, and to practice one-to-one correspondence. They identify and reproduce shapes and patterns, form arrays, compose and decompose numbers, measure, estimate, and much more.

Active, appropriate use of computers in kindergarten supports and extends traditional learning materials.⁽⁴⁾ The use of Starfall.com in the classroom computer centers is one of the tools children use to acquire knowledge and skills and solve math problems in interactive, open-ended learning activities. For example, research supports the use of computers to allow children to manipulate shapes with greater dexterity than they can manage by hand and to promote problem-solving.⁽⁵⁾

(1) National Research Council (2009). *Mathematics Learning in Early Childhood: Paths toward Excellence and Equity*. Washington, DC: National Academies Press.

(2) Curtis, R., Okamoto, Y. & Weckbacher, L. M. (2009). Preschoolers' use of count information to judge relative quantity. *Early Childhood Research Quarterly*, 24 (3), 325-336.

(3) Siegler, R.S., and Ramani, G. B. (2008). "Playing Linear Numerical Board Games promotes Low-income Children's Numerical Development," *Developmental Science*, 11:5, pp 655-661.

(4) National Association for the Education of Young Children and Fred Rogers Center for Early Learning and Children's Media (2012). Technology and interactive media as tools in early childhood programs serving children from birth through age 8: A joint position statement.

(5) Clements, D. H. (2002). Computers in early childhood mathematics. *Contemporary Issues in Early Childhood*, 3(2), 160-181.

Unit 3 Frequently Asked Questions

Why does Starfall Math include Learning Centers only one day a week?

Kindergarten teachers spend nearly twice as much instructional time on reading compared with mathematics. This pattern continues in the typical school through at least fourth grade. The average math time allotment is between 45 and 60 minutes per day. Scheduling three or four learning centers per day, and allowing a minimum of ten minutes per center, results in 40 minutes for a class of 20 children or less not including transitional time, set up, and clean up. This leaves only ten minutes for group instruction and/or partner learning each day.

Starfall's remedy is to schedule four days of group and partner learning, including formative assessment activities, and to devote the fifth day to practicing skills learned each week, thereby providing enough time for the children to engage in their center activities while also providing the teacher with an opportunity to conduct formal summative assessments.

What does a Learning Center rotation entail?

The Learning Centers are designed to review and practice skills taught in the previous four daily sessions. They include two activities or games, a Teacher's Choice activity or game, a computer assignment from Starfall.com, and a teacher-directed activity that is combined with a summative assessment. The children rotate approximately every twelve to fifteen minutes. The Summative Assessment Center provides an opportunity to not only assess the children, but also to ask questions and determine on which developmental level each child is functioning for that particular skill. Checklists are provided to record results, observations, and anecdotal notes.

What kind of partner learning takes place during instructional time?

Instructional time begins with a whole group presentation. The children practice the concepts introduced and/or reviewed through activities using their Starfall Math Bags (which contain math manipulatives), whiteboards, and/or other hands-on math materials. The children often partner using a cooperative learning technique outlined in the lesson plans. Daily instructional time also includes formative assessments. Formative assessments are the key to creating the learning environment needed to meet individual children's needs and improve learning outcomes. During this formative assessment teachers observe children and ask open-ended questions, such as "Why?" or "How did you know?" questions. This information then informs any remediation that might need to take place either as a group or for individuals.