

Introduction: Making More of Math and Executive Function Skills

In addition to building a foundation for later math learning, early math activities provide opportunities to promote the development of children's executive function (EF) skills, which may in turn support mathematical thinking. In this article we introduce EF skills, describe their importance, briefly summarize their relation with math, and explain how early math can help promote executive function skills.

What Are Executive Function Skills?

Executive function skills are cognitive skills used to intentionally evaluate and control our own thoughts and actions.

EF skills include:

- **Sustained attention:** Ignoring distractions while focusing on a task.
- **Inhibitory control:** Resisting making an impulsive, automatic response when a different, intentional response is more appropriate for reaching a goal.
- **Cognitive flexibility:** Considering several approaches to solving a problem, thinking about a situation in different ways, and shifting attention between tasks.
- **Working memory:** Simultaneously thinking about and manipulating information in our mind.

How Are Executive Function Skills Related to Math?

People use EF skills to pay attention, stay on task, think before answering, find different ways to solve a problem, and keep track of what steps to carry out while following instructions—behaviors that play a role when learning and doing math. Of course, executive function skills are also related to many other behaviors, including turn-taking and collaborating with others. It is no wonder executive function skills are so important!



Why Focus on Math and Executive Function Skills for Preschoolers?

- High-quality mathematics tasks encourage children to engage their math and executive function skills [1-3], and thus provide opportunities to practice both types of skills.
- Opportunities to practice executive function and math skills are important because there is evidence that both types of skills can improve with practice.
- The part of the brain responsible for executive function skills develops rapidly during the preschool years. This means that preschool teachers can provide children opportunities to practice executive function skills during a period of rapid brain development [4].

There are many ways executive function skills surface when learning and doing math. The DREME Guided Small Group Math Activities were designed to specifically help teachers: 1) recognize and prioritize the executive function skills involved in math, and 2) identify teaching practices that may help teachers support children's development of mathematical thinking and executive function skills. We include examples of these DREME Guided Small Group Math Activities in each of the other articles on math and executive function skills. We also share examples of DREME Center/Small Group Math Activities or DREME Math Moments that provide opportunities to practice executive function skills while learning or doing math.

References:

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