

## Inhibitory Control, Sustained Attention, and Early Math Skills

Tyron and Shae take turns using the magic of counting to solve a problem! Ten cards numbered 1 to 10 lay in a row before them; the cards have been flipped over so the numbers are not visible. Shae, the “pointer,” points to one of the cards, and Tyron, the “magician,” must figure out what number is on the card. Starting with the first card on the far left, Tyron counts up from “one” to “four.” [The activity described here is from the DREME Guided Small Group Math Activity: Magician’s Tricks]



### What Are Sustained Attention and Inhibitory Control, and How Might They Be Used During Math Activities?

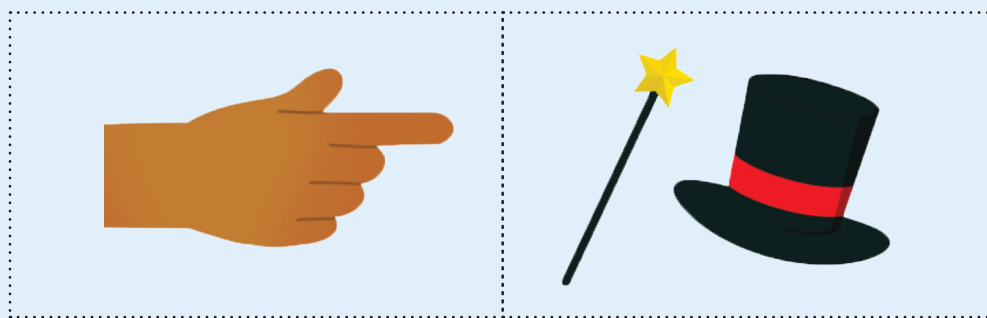
- **Sustained attention** is the ability to ignore distractions while focusing on a task. Tyron might use sustained attention to keep counting up to his target (the “fourth” counting card) without being distracted by a desire to play with the cards or the magic wand, or by other things happening in the classroom.
- **Inhibitory control** is the ability to resist making an impulsive, automatic response when a different, intentional response is more appropriate for reaching a goal. A goal of the Magician’s Tricks activity is to identify the number on the card that one’s partner selects. In the example in the vignette, Tyron might have needed to effortfully resist the urge to continue counting after reaching the target card that Shae pointed to, and Shae might have needed to resist counting during Tyron’s turn.

### How Can We Support Sustained Attention and Inhibitory Control Skills in Preschool Settings?

**Turn-taking** is one way to support sustained attention and inhibitory control because it requires children to wait for their turn and listen or watch while their peer takes a turn. This means children need to resist responding when it’s not their turn. Turn-taking occurs in many other math activities. For example, in one version of the DREME Guided Small Group Math Activity: What Shape Am I Touching?, one child hides multiple shapes in a box and the other child tries to identify the objects through touch or a description. Children take turns being the person to hide the shapes and the person who feels and identifies the shape inside the box.

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**Role Cards** can support turn-taking by giving children a physical reminder to maintain attention on their current task and inhibit acting out of turn or deviating from their role. For example, the images to the right are role cards used in the DREME Guided Small Group Math Activity: Magician's Tricks, described in the vignette.



**Think-Pair-Share** is a strategy that builds on turn-taking by encouraging children to slow down, check their work, and think about their answer before taking a turn to compare solutions or responses with a partner. Each of these Think-Pair-Share behaviors is effortful, and may help children practice executive function skills while engaging in mathematical thinking. Turn-taking and Think-Pair-Share are featured in all of the DREME Guided Small Group Math Activities.

Ignoring distractions, focusing on a task, and resisting impulsive responses involve effort, but the effort needed to succeed may decrease after repeated practice. The DREME Guided Small Group Math Activities were intentionally designed to provide students many opportunities to slow down, respond intentionally rather than impulsively, and focus on their assigned role, all while doing math! In this way, children get to practice their math and executive function skills simultaneously.

Sustained attention and inhibitory control are only two of several executive function skills that are useful during number and counting activities. See the additional DREME articles on math and executive function to learn ways that cognitive flexibility and working memory are related to numbers and counting.