

## Overview

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When people think about specific learning disabilities (SLDs), the first things that come to mind are often reading, spelling, and writing. But learning disabilities can impact mathematics as well. A common SLD that impacts literacy is often referred to as *dyslexia*, and a common LD in math is called *dyscalculia*. As with other forms of learning disabilities (LDs), there isn't just one profile of deficits attributed to dyscalculia. And it's not uncommon for a person to have characteristics of multiple SLDs, including literacy and numerical learning difficulties.

Dyscalculia is commonly defined as:

*A condition that affects the ability to acquire arithmetical skills. Dyscalculic learners may have difficulty understanding simple number concepts, lack an intuitive grasp of numbers, and have problems learning number facts and procedures. Even if they produce a correct answer or use a correct method, they may do so mechanically and without confidence.<sup>1</sup>*

## A Closer Look at Learning Disabilities in Math

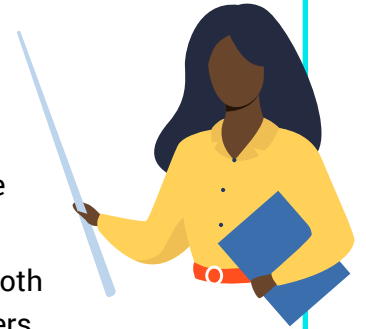
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Not everyone who struggles with math has a learning disability in math (dyscalculia), and the lack of research makes it extremely difficult to differentiate between individuals whose difficulties are “primary” (a congenital disability caused by unique patterns of neurological processing) and “secondary” (a struggle with math caused by factors that are primarily instructional or environmental). Observing that someone has trouble attributing the quantity of numbers with the Arabic symbol and understanding their correlation is not enough to determine whether they have a disability. Any of the following factors can have a negative impact on math learning:

- Trouble focusing and sustaining attention, which can be caused by attention-deficit hyperactivity disorder (ADHD)
- Weaknesses in short-term (working) memory, often referred to as a key executive function skill
- Missed or poor instruction or lack of mastery in core foundational skill development, often referred to as “number sense”
- Low self-esteem about math ability or math anxiety, which is all too often conveyed to children by adults
- These factors can result in a struggle in math learning, but they do not necessarily confirm the presence of a learning disability in math.

## FAST FACTS

- Dyscalculia affects **3% to 6% of people**<sup>2</sup> but is far less studied than other learning disabilities like dyslexia. It is estimated that there is a **14:1 ratio** between published research in dyslexia compared to that of dyscalculia.<sup>3</sup>
- The neurobiology of dyscalculia is an evolving field of study. Much less is known about how the brain processes math-related information, resulting in fewer evidence-based teaching approaches and a lack of understanding about how best to accommodate students who have developmental dyscalculia. Recent brain research points to the processing of **numerical magnitude representation** as a way to explain math difficulties that could be attributed to dyscalculia, but more data are necessary to translate these findings into practice.<sup>3</sup>
- **Early numeracy skills** have been proven to correlate to performance in both math and reading.<sup>4</sup> Not unlike the relationship between sounds and letters in literacy, numeracy is the comprehension of the relationship between the quantities and the symbol representations of numbers. It is increasingly common to see children who have co-occurring disorders in both literacy and numeracy.



## NCLD believes:

1. High-quality, inclusive math education must become a national focus, especially in early grades, providing students with opportunities to succeed in school and resulting in the development of a strong and career-ready workforce.
2. Pre-K–12 educators in math as well as science and other curriculum areas must be equipped to provide high-quality and effective math instruction and support to all students who struggle with math learning.
3. Additional and ongoing research is needed to understand and effectively address the needs of students whose math learning needs are not being met.

## To improve the knowledge of math learning disabilities and the implementation of effective interventions, NCLD advocates for:

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- Increasing funding under Parts B and C of the Individuals with Disabilities Education Act (IDEA) to improve early identification and interventions that focus on numeracy skills.
- Providing additional funding to Part D of IDEA to equip educators and parents with the resources necessary to effectively teach and support students with learning disabilities in math.
- Increasing funding for the Institute of Education Sciences and the Eunice Kennedy Shriver National Institute of Child Health and Human Development to prioritize and conduct math-specific learning disability research.
- Enhancing dissemination of and access to evidence-based math practices to ensure that educators have the resources needed to effectively instruct students.

- 1 U.K. Department for Education and Skills. (2001). Guidance to support pupils with dyslexia and dyscalculia. *The National Numeracy Strategy*. [http://scotens.org/sen/resources/dyslexia\\_leaflet\\_maths.pdf](http://scotens.org/sen/resources/dyslexia_leaflet_maths.pdf)
- 2 Wilkey, E. D., Pollack, C., & Price, G. R. (2020). Dyscalculia and typical math achievement are associated with individual differences in number-specific executive function. *Child Development*, 91(2), 596–619. <https://doi.org/10.1111/cdev.13194>
- 3 Price, G. R., & Ansari, D. (2013). Dyscalculia: Characteristics, causes, and treatments. *Numeracy*, 6(1), Article 2. <http://dx.doi.org/10.5038/1936-4660.6.1.2>
- 4 Ansari, D. (2018). "Building Blocks of Mathematical Competence." Western Education. <https://www.youtube.com/watch?v=xUUj0cqYRQU>



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