



A Publication of the Council for Learning Disabilities

August 2016

President's Message



I am so honored and proud to be serving this outstanding organization as its president for the 2016–2017 academic year. Over the past two years in my capacity as vice-president and president-elect, I've learned so much about and from the wonderful, dedicated people who keep CLD at the forefront of teaching, research, and policy for people with learning disabilities.

As I step into the role of president, I sincerely wish to thank Immediate Past President **Dr. Diane Bryant**, who has led our organization with compassion, integrity, and a strong dedication to the building of CLD into the vibrant organization it is today. Thank you, Diane, for providing a leadership legacy that I and so many other people are proud to continue!

I would also like to take this opportunity to thank the people involved in the Executive Committee (EC) and Board of Trustees (BOT) whose commitment and enthusiasm to the Mission and Vision of CLD (see this issue of *LD Forum*) is apparent in every decision and activity undertaken by this amazing group of people. The EC and BOT devote hundreds of hours each year to working for our organization in the pursuit of making CLD a strong voice for people with learning disabilities and those who work with and support them (e.g., researchers, teachers, policymakers, parents). See the EC and BOT roster in this issue of *LD Forum*!

Along this same line, I'd like to sincerely thank our continuing and new CLD members. CLD genuinely appreciates your membership, support, and involvement with committees, conferences, and recruitment of new members. Our membership numbers—as well as our conference attendance and committee involvement—are growing. These trends are very exciting to all involved with CLD. On this note, I invite all continuing and new CLD members not currently involved with a committee to consider becoming actively involved. Please feel free to contact anyone on the EC and BOT to find out the different ways you can become involved in CLD. For information about each committee's responsibilities, please contact the chair of that committee, whose contact information can be found at the following webpage (<http://www.council-for-learning-disabilities.org>).

Our CLD state chapters are also growing! We enthusiastically welcome our newest state chapter in Nevada. State chapters are fundamental to CLD's support of special education teachers at the local and regional levels. They are on the front lines of service and instructional assistance to our teachers, who dedicate themselves to students with LD. If you and/or your colleagues are interested in starting a state chapter, please contact **Dr. Colleen Reutebuch**, the chair of our Leadership Development Committee.

CLD provides a unique opportunity for future leaders through our innovative Leadership Academy. This successful academy was created to grow future CLD leaders by providing one-on-one mentoring with a senior CLD member. Many of our past Leadership Academy members are now participating in leadership roles for CLD. We are pleased to announce the beginning of our Sixth Cohort! Please watch for the announcement for nominations to the Seventh Cohort in a future *LD Forum*. If you are interested in the Leadership Academy program either as an applicant or as a mentor, please contact the chair of this committee, **Dr. Paul Riccomini**.

Please plan to attend our 38th International Conference on Learning Disabilities in San Antonio, Texas, on October 13th and 14th, 2016. This year we are pleased to announce that **Dr. Jack Fletcher**, a Hugh and Lillie Cranz Cullen

(continued on page 8)

In This Issue . . .

- President's Message 1
- 5 Ways To 2
- 38th International Conference on LD 5
- Call for Nominations 6
- IES Practice Guide 6
- Committee & Chapter News 6
- 2016–2017 Board of Trustees 7
- CLD News & Notes 7

Editor's Note: This column provides readers with immediate access to evidence-based strategies on current topics that can easily be transferred from the pages of LD Forum into effective teaching practice in CLD members' classrooms. Authors who would like to submit a column are encouraged to contact the editor in advance to discuss ideas. Author guidelines are available on CLD's website.

5 Ways To ...

Scaffold Mathematics Instruction for Secondary Students with Learning Disabilities

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The majority of students with learning disabilities (LD) in middle and high school receive mathematics instruction in general education classrooms despite the fact that up to a quarter of these students' mathematics performance is considered "very below average" (National Center for Learning Disabilities, 2014). Although a mathematics achievement gap between students with and without disabilities is evident in elementary school, the gap widens as students enter middle and high school (National Assessment for Educational Progress, 2015). In effect, middle and high school mathematics teachers are responsible for meeting the instructional needs of students with extremely varied skill sets and ability levels. Complicating matters further, many mathematics programs and texts aligned with grade-level curricula fail to provide suggestions for how to adapt instruction and materials for struggling learners. Five simple ways to scaffold middle and high school mathematics instruction are presented here to help teachers meet the considerable challenges they face in providing effective instruction for all the learners in their classes.

1 Create guided notes to scaffold lectures, the text, and video or multimedia instruction.

Secondary mathematics teachers often rely on lecture as the primary method of content delivery. Students are expected to take lecture notes and to use their notes to complete homework and study for tests, but middle and high school students with LD generally demonstrate poor note-taking skills and struggle to use their independent notes effectively (e.g., Boyle, 2010). Guided notes support students with LD by accommodating skill deficits (e.g., in listening comprehension and writing) and reducing some of the cognitive demand associated with note taking, which in turn frees up attention and working memory for content acquisition.

A review of the literature revealed that the use of guided notes was consistently related to increased accuracy of notes and better test scores (Haydon, Mancil, Kroeger, McLeskey, & Lin, 2011). Guided notes are typically presented as a lecture outline with blank spots where students are required to fill in missing critical information such as key facts, vocabulary, and definitions. Mathematics teachers can add special features, such as graph paper to help students draw straight lines and avoid misaligning columns of numbers when calculating. In addition to creating guided notes aligned to class

lectures, teachers can also design guided notes to support students during small-group and independent work activities. Figure 1 is an example of a guided notes sheet aligned with an instructional video to focus students' attention during viewing and to aid in the creation of a helpful resource that students can reference at a later time.

2 Use the concrete–representational–abstract (CRA) instructional sequence. The CRA sequence is a multiple representation strategy with demonstrated effectiveness for helping middle and high school students with LD improve their performance in various mathematics content areas, including fractions (e.g., Butler, Miller, Crehan, Babbitt, & Pierce, 2003), algebra (e.g., Strickland & Maccini, 2013), and geometry (e.g., Dobbins,

Exponent Video Assignment	
Name: _____	Date: _____
Directions: Watch the video once paying close attention, then re-watch the video and complete this guided notes sheet as you watch the second time.	
Video Title: Intro to Exponents, 3 minutes	
Video Link: https://www.khanacademy.org/math/cc-sixth-grade-math/cc-6th-arithmetic-operations/cc-6th-exponents/v/introduction-to-exponents	
(0:02) We can view multiplication as _____ addition	
$2 \times 3 = \underline{\quad} + \underline{\quad} + \underline{\quad} = \underline{\quad}$	
(0:25) We can view taking an exponent as repeated _____	
$2^3 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$	
$3^2 = \underline{\quad} \times \underline{\quad} = \underline{\quad}$	
$5^4 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$	
Check your understanding after watching the video:	
$4^3 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} = \underline{\quad}$	
$5^2 = \underline{\quad}$	
$2^4 = \underline{\quad}$	

Figure 1. Sample guided notes sheet for use with supplemental video-based instruction.

(continued on page 3)

(5 Ways To, continued from page 2)

Gagnon, & Ulrich, 2014). Research has shown that students who use multiple representations before solving abstract problems display greater motivation, higher levels of on-task behavior, and a greater ability to apply learning to real-life situations (Mancl, Miller, & Kennedy, 2012; Witzel, Riccomini, & Schneider, 2008).

In the concrete stage, the teacher models and provides practice with a mathematical concept using manipulatives (e.g., chips, cubes, base-10 blocks). In the representational stage, the teacher transforms the concrete model into a drawing or pictorial representation using circles, dots, or tally marks. In the abstract stage, the teacher models the mathematical concept symbolically (e.g., with an equation). An illustration of the CRA instructional sequence applied to word problem instruction is presented in Figure 2.

When using CRA instruction to teach initial fraction concepts, teachers might first have students manipulate concrete fraction circles to represent parts of a whole, then create partially shaded circle diagrams to represent parts of a whole, and finally learn to symbolically represent parts of a whole using formal fraction notation (e.g., a/b). Dobbins et al. (2014) found that combining CRA instruction with peer practice was an effective method for teaching the concepts of *area* and *perimeter* to students struggling in mathematics. Student participants learned to (a) find the area of geometric shape manipulatives in the concrete phase of instruction, (b) find the area of drawings of geometric shapes in the representational phase, and finally (c) use the area formula in the abstract phase. After whole-class instruction in each phase of the CRA sequence, students engaged in structured practice with a peer (Dobbins et al., 2014). This routine could be adapted to teach and practice a wide variety of secondary mathematics skills and concepts.

3 Scaffold independent practice using the interleave worked solution strategy (IWSS). In applying the IWSS to mathematics practice worksheets, teachers alternate fully worked and solved example problems with closely matched problems for students to solve independently. Students are instructed to study worked examples to help solve independent problems. The Institute for Education Sciences (IES; Pashler et al., 2007) recommended the IWSS strategy, citing evidence that in-

terleaving worked examples and independent problems led to faster, more accurate performance than the traditional practice of giving problem sets for students to solve completely independently (e.g., Kalyuga, Chandler, & Sweller, 2001). The structure of IWSS practice is especially beneficial for middle and high school students with LD because it helps to compensate for characteristic weaknesses in organization, memory, and persistence.

To create IWSS worksheets for homework or in-class practice, teachers should select closely matched pairs of problems and provide all solution steps for one problem from each pair. IWSS worksheets often contain worked examples for odd numbered items and require independent solutions for even numbered items. As student performance improves, teachers can fade support by providing fewer fully worked problems or provide partially worked problems in place of fully worked problems in a problem set (Renkl, Atkinson, & Große, 2004). For example, on a 10-item worksheet, Items 2, 4, 6, and 8 could be fully independent; Items 1, 3, and 5 could be fully worked, and Items 7 and 9 could be partially solved but require students to fill in missing pieces. To ensure that students with LD use the strategy correctly, teachers should model its use by thinking aloud as they study worked examples and clearly demonstrating how to apply worked example solution steps to novel problems.

4 Use cover-copy-compare (CCC) to build fact fluency and support higher-level learning.

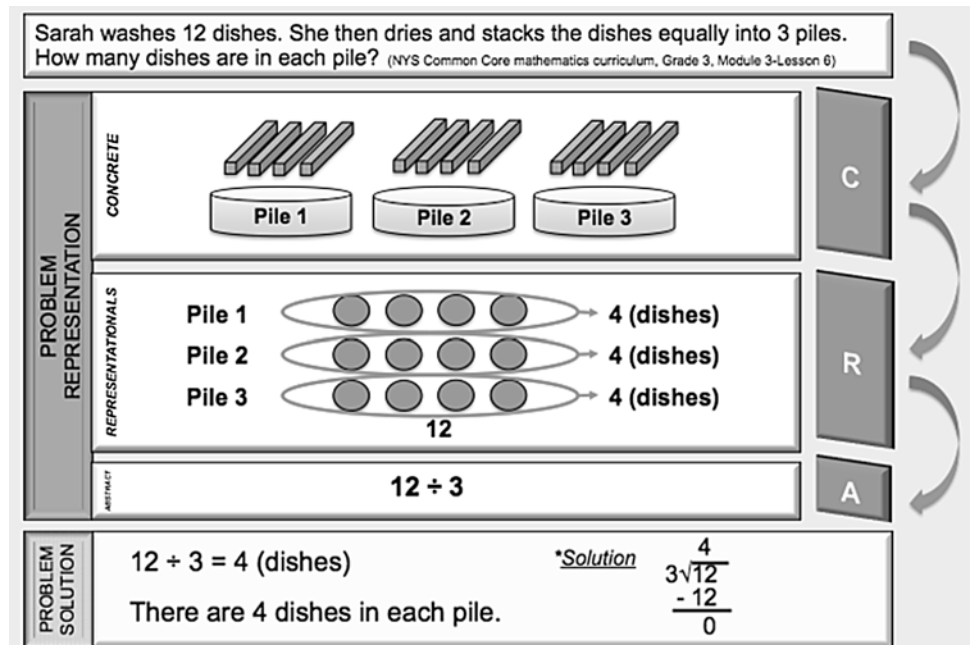


Figure 2. An illustration of CRA sequence instruction applied to word problem solving.

(continued on page 4)

(5 Ways To, continued from page 3)

Cover, copy, compare is a simple, efficient strategy that can be used to improve fact fluency and maintenance (Joseph et al., 2012). Although secondary mathematics teachers may consider fact fluency a basic skill that is outside the scope of their teaching responsibilities, devoting a few minutes of instructional time each class period to fluency building can help struggling students achieve quick, accurate fact retrieval and, in effect, free up the working memory resources students need to solve complex, grade-level problems. Fact fluency provides a foundation for more complex mathematics, and improvements in fact fluency support improvements in higher level skills and concepts. CCC supports learning by incorporating modeling, practice opportunities, and immediate corrective feedback (Skinner, Bamberg, Smith, & Powell, 1993); and it has been linked to high levels of student engagement and the development of self-management skills (Belfiore, Lee, Scheeler, & Klein, 2002; Skinner et al., 1993).

Cover, copy, compare fluency-building practice typically uses a three-column worksheet (see Figure 3). The facts students will practice are listed in the first column, and the second and third columns provide blank spaces for students to record their responses. Students are instructed to read the fact and solution in the first column, then cover the fact and write the fact and solution from memory in the second column, then uncover the model and check their response (e.g., Joseph et al., 2012). If the response is correct, students move on to the next fact; if it is incorrect, students try again using the third column to record their revised solution.

5 Use Frayer model graphic organizers to support math vocabulary development. Learning a large body of new vocabulary is essential for success

Cover-Copy-Compare Practice Sheet		
Name:		Date:
Fact	Write	Repeat
$6 \times 1 = 6$		
$6 \times 2 = 12$		
$6 \times 3 = 18$		
$6 \times 4 = 24$		
$6 \times 5 = 30$		
$6 \times 6 = 36$		
$6 \times 7 = 42$		
$6 \times 8 = 48$		
$6 \times 9 = 54$		
$6 \times 10 = 60$		

Figure 3. Cover-copy-compare worksheet template.

in secondary mathematics. Students with LD, however, demonstrate lower overall vocabulary knowledge compared to that of their typical achieving peers (Simmons & Kame'enui, 1990) and need additional support to learn critical new terms. The Frayer model, a type of graphic organizer developed by Dorothy Frayer and colleagues at the University of Wisconsin, makes explicit the meaning and critical attributes of a term or concept (see Figure 4).

Frayer models allow students with LD a chance to organize information in a manner that builds conceptual understanding. For example, Fore, Boon, and Lowrie (2007) found that the use of Frayer model graphic organizers resulted in greater learning of content area vocabulary for middle school students with LD.

Vocabulary instruction that incorporates a Frayer model can be used flexibly based on students' needs, but teachers of students with LD should begin instruction with the definition of the mathematical term or concept presented in a "student-friendly" manner. Beck, McKeown, and Kucan (2002) noted that student-friendly definitions are ones that are easily understood. For example, instead of using the textbook definition of *polygons*, which may include the words *dimensional*, *vertices*, and *segments*, a student-friendly definition would use simplistic words and phrases that are from students' day-to-day vocabulary (see Figure 4).

Next, the *critical attributes of the concept* should be determined and explicitly demonstrated, as students will use this information to determine examples and non-examples. For instance, the critical attributes of a polygon include the following: flat shape, closed figure, with at least 3 straight lines and angles. Teachers should stress the fact that all critical attributes must be present for something to be an example of a given concept.

After determining the critical attributes, teachers should explicitly model how to determine examples and non-examples

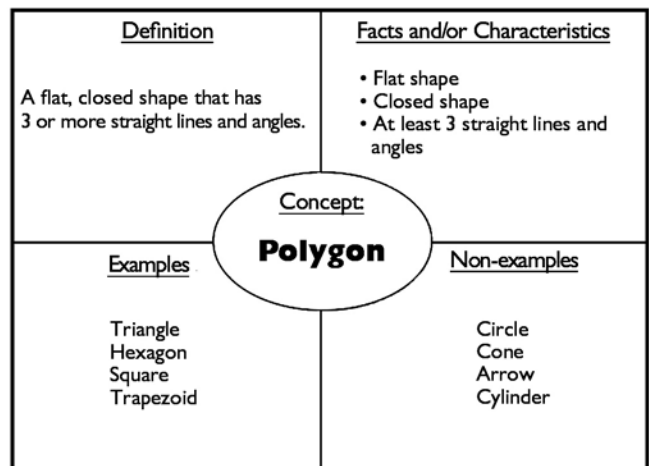


Figure 4. Example of a Frayer model graphic organizer.

(continued on page 8)



SEE YOU IN SAN ANTONIO!

38th International Conference on Learning Disabilities

OCTOBER 13-14, 2016

<http://www.council-for-learning-disabilities.org/professional-development/2016-annual-conference-2>

Plans for the 2016 CLD Conference in San Antonio, Texas, are now in high gear. The conference will be held at the **Hilton Palacio del Rio**, only steps from the popular **Riverwalk**. Highlights from the conference program and opportunities for sponsorship are given below!

☀️ 2016 J. Lee Wiederholt Distinguished Lecturer



Jack M. Fletcher, PhD, is the 2016 J. Lee Wiederholt Distinguished Lecturer. Dr. Fletcher is the **Hugh Roy and Lillie Cranz Cullen Distinguished Professor of Psychology at the University of Houston**. For the past 35 years,

Dr. Fletcher, a child neuropsychologist, has conducted research on children with learning and attention disorders and brain injury. He served on the 2002 President's Commission on Excellence in Special Education. Dr. Fletcher received the Samuel T. Orton Award from the International Dyslexia Association in 2003 and was a co-recipient of the Albert J. Harris Award from the International Reading Association in 2006.

Dr. Fletcher's keynote address is titled ***Understanding Dyslexia: What's the Fuss About?*** This presentation will discuss a scientific view of dyslexia as a well-understood form of learning disability with specific reading, cognitive, neural, and genetic characteristics.

☀️ Conference Program

Deborah Reed, CLD president-elect and program chair, has put together an exceptional conference program. Dr. Reed has selected **more than 15 panels, 40 roundtables, and 90 interactive papers** for the 2-day conference. Topics cover math, writing, reading, technology, response to intervention, and more.

☀️ Sponsorships Available

Your institution or businesses you frequent may be interested in sponsoring an award or the Leadership Academy training, providing materials for registration packets or a take-away table, or in other ways supporting the conference and CLD. Sponsors will receive recognition and visibility during and following the conference. Contact **Maria Peterson-Ahmad** via email (petermahmadm@wou.edu) for more information.

See you in San Antonio!

Call for Nominations for CLD Officer: Vice President

The Executive Committee of the Board of Trustees is seeking nominations for the position of CLD vice president. The vice president serves a one-year term in this position and automatically succeeds to the positions of president-elect, president, and past president. The vice president serves as the program chair for the Annual Conference on Learning Disabilities and serves in the president's place and with his or her authority in case of absence or disability of the president and president-elect. The vice president assists in the plan of operation for the organization, charges to committees, and the annual CLD budget.

Nominations will be accepted until the Annual Business Meeting, to be held at 8:00 a.m. on Friday, October 14, 2016,

in San Antonio, Texas, at the Council for Learning Disabilities conference. Nominees must consent to the nomination to stand for election and must submit at least five signatures from current members of CLD on the official nominations form, which can be found at this website (<http://www.council-for-learning-disabilities.org/governance>). A biographical sketch that includes evidence of the candidate's qualifications must accompany the nominations form. Nominations must be submitted to **Dr. Diane Pedrotty Bryant**, nominations chair, via e-mail (dpbryant@austin.utexas.edu) or given to Dr. Bryant at the conference on **Thursday, October 13, 2016, no later than 5:00 p.m.**, at which time nominations will close.

IES Practice Guide: Supporting Foundational Skills in Reading for Understanding in Grades K–3

The Institute of Education Sciences (IES) recently published a practice guide, *Foundational Skills to Support Reading for Understanding in Kindergarten Through 3rd Grade*. This guide focuses on providing recommendations for teaching foundational reading skills to students in kindergarten through Grade 3. It also offers a summary and evidence for each recommendation. The panel that developed the practice guide was composed of experts in literacy instruction, in-

cluding three experts in special education. The practice guide can be downloaded for free from the What Works Clearinghouse, via this weblink (<http://ies.ed.gov/ncee/wwc/PracticeGuide.aspx?sid=21>). CLD members interested in literacy instruction are encouraged to download this guide for use in the classroom or in preparation of preservice and in-service teacher candidates.

Committee & Chapter News

Colorado Chapter News

The Board of the Colorado Council for Learning Disabilities is excited to launch a new year of offerings for our members. CCLD provides professional development opportunities in a variety of ways. We are forming a partnership with the **Literacy and Learning Institute** and **Colorado College** to provide tuition scholarships for teachers who are completing the Literacy Interventionist Program offered through Colorado College. We are excited about a partnership that will provide our classroom teachers and interventionists with a strong knowledge of research-based reading instruction.

This year marks the 15th year for *Math on the "Planes,"* the most recognized professional development offering for

math teachers and interventionists in Colorado. We are fortunate to have **Dr. Karen Karp** as our presenter. This highly interactive workshop will address Tier 1 instruction and Tier 2 interventions for supporting students in a K–5 setting who struggle with learning mathematics. Conference dates and details can be found on our website (www.coold.org)

Courage to Risk, a collaborative conference sponsored by CCLD, will be held on January 27 and 28, 2017, at the Broadmoor Hotel in Colorado Springs. Keynote speakers include **Dr. Barbara Oakley**, author of *A Mind for Numbers* and a professor of engineering at Oakland University, and **Dr. Jerome Schultz**, neuropsychologist and faculty member at the Harvard Medical School.

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CLD NEWS & NOTES ...

- ▶ The **38th Annual International Conference on Learning Disabilities** will be held on **October 13–14, 2016**, in San Antonio, Texas! We look forward to seeing you there! For additional information go to this website (<http://goo.gl/CvSdoi>).
- ▶ LD Forum is currently seeking manuscripts, including submissions for two new columns: “Point/Counterpoint” and “Current Issues in Review.” For manuscript submission guidelines, visit this webpage (<http://goo.gl/PcgWUI>). We are also seeking individuals to serve on our review board. Contact the LD Forum editor, **Joseph Morgan** (ldforum@unlv.nevada.edu), for more information.
- ▶ Check out the latest issues of Learning Disability Quarterly and Intervention in School and Clinic! Also, consider submitting your work for publication in our flagship journals.

CLD Mission & Vision

Mission Statement: The Council for Learning Disabilities (CLD), an international organization composed of professionals who represent diverse disciplines, is committed to enhancing the education and quality of life for individuals with learning disabilities across the life span. CLD accomplishes this by promoting and disseminating evidence-based research and practices related to the education of individuals with learning disabilities. In addition, CLD fosters (a) collaboration among professionals; (b) development of leaders in the field; and (c) advocacy for policies that support individuals with learning disabilities at local, state, and national levels.

Vision Statement: All individuals with learning disabilities are empowered to achieve their potential.

(President's Message, continued from page 1)

Distinguished Professor of Psychology at the University of Houston, will be our keynote speaker.

The numerous and diverse presentations for this two-day conference represent all aspects of learning disabilities. We are proud of the information, discussions, and networking the CLD conference provides nationally and internationally to researchers, teachers, policymakers, parents and people with learning disabilities. See you in San Antonio!

CLD is proud to offer its members two highly respected journals, *Learning Disability Quarterly* (LDQ) and *Intervention in School and Clinic* (ISC). These journals are provided free with CLD membership along with our *Research-to-Practice Corner* and *LD Forum*. These publications offer

CLD members and the community up-to-date information on research, instruction, and policies for people with LD.

CLD provides opportunities for anyone interested in any aspect of persons with LD. We invite you to explore our website (<http://www.council-for-learning-disabilities.org>) and find areas where your interests intersect with CLD committees, CLD state chapters, and/or CLD journals and publications. CLD offers something for everyone interested in supporting persons with LD. I hope you will become involved in CLD and help us to move forward our vision: "All individuals with learning disabilities are empowered to achieve their potential."

Mary Beth Calhoon
2016–2017 CLD President

(5 Ways To, continued from page 4)

using self-questioning to make the process transparent. For example, a teacher would draw a triangle on the board and ask the following questions: Is this a flat shape? (Yes). Is this a closed figure? (Yes.) Does it have at least 3 straight lines and angles? (Yes.) So, is this an example of a polygon? (Yes.) Similar questioning is used to work through both examples and non-examples (e.g., a shape that is missing at least one critical attribute).

Conclusion

Secondary students with LD have a variety of unique and challenging learning needs that must be addressed during mathematics instruction. To support their learning, teachers must consider the five instructional scaffolds presented here when planning instructional activities. Each of the scaffolds can be used by all teachers of secondary mathematics within the constraints of the general education classroom. Implementing these instructional supports can improve the overall quality of instruction, better support the needs of students with learning disabilities, and provide both students and teachers with opportunities to experience more success in mathematics.

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