

Strategies for Effective Teaching and Learning

Supporting Mathematics Problem Solving for Students With Learning Disabilities

Students with learning disabilities often struggle with mathematics, with problem solving being one particular area of difficulty. The following are evidence- or research-

based interventions to support students with learning disabilities with problem solving at the elementary and secondary levels.

Elementary	Secondary
Cognitive and Metacognitive Strategies	
<ul style="list-style-type: none">Students approach problem solving using FAST DRAW: Find the question Ask the parts of the problem needed Set up the problem Tie down the sign Discover the sign Read the number problem AnsWER the number problem Write the answer (Cassel & Reid, 1996)	<ul style="list-style-type: none">Students approach problem solving using seven cognitive phrases—Solve-It: Read Paraphrase Visualize Hypothesize Estimate Compute Check (along with three meta-cognitive processes: say, ask, and check) (Montague, 2008)
Schema-Based Strategies	
<ul style="list-style-type: none">Students approach problem solving with the COMPs model: Organize the problem using a conceptual model Transform the model into a mathematical equation Solve and check the answer (Xin et al., 2011)	<ul style="list-style-type: none">Students approach problem solving using FOPS: Find the problem Organize the information with a diagram or visual schematic representation Plan how to solve the problem Solve the problem (Jitendra, George, Sood, & Price, 2010)
Concrete–Representational–Abstract (CRA) Strategies	
<p>Students move across three phases to support problem solving:</p> <ol style="list-style-type: none">Concrete phase: use concrete manipulatives to represent a problemRepresentational phase: draw pictures to represent the problemAbstract reasoning phase: use abstract reasoning to solve the problem (Mancl, Miller, & Kennedy, 2012)	

SOURCES:

Cassel, J., & Reid, R. (1996). Use of a self-regulated strategy intervention to improve word problem-solving skills of students with mild disabilities. *Journal of Behavioral Education*, 6, 153–172.

Jitendra, A., George, M., Sood, S., & Price, K. (2010). Schema-based instruction: Facilitating mathematical word problem solving for students with emotional and behavioral disorders. *Preventing School Failure*, 54, 145–151.

Mancl, D., Miller, S., & Kennedy, M. (2012). Using the concrete-representational-abstract sequence with integrated strategy instruction to teach subtraction with regrouping to students with learning disabilities. *Learning Disabilities Research & Practice*, 27, 152–166.

Montague, M. (2008). Self-regulation strategies to improve mathematical problem solving for students with learning disabilities. *Learning Disability Quarterly*, 31, 37–44.

Xin, Y., Zhang, D., Park, J., Tom, K., Whipple, A., & Si, L. (2011). A comparison of two mathematics problem-solving strategies: Facilitate algebra-readiness. *The Journal of Educational Research*, 104, 381–395.