Making Math Meaningful for Autistic Students

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| Big Idea 1 | Math is meaningful when students can generalize skills to solve problems in their everyday lives |

* Instruction must support students to progress through all four stages of learning
  + Acquisition
  + Fluency
  + Maintenance
  + Generalization

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| Big Idea 2 | Curricular focus & perceived ability may cause Autistic students to be victims of low expectations |

* The instructional focus for students with developmental disabilities has evolved over the past 50 years
* Changes in policy impacted research and practice
* Research findings have inconsistently been incorporated into policy & practice
* Disability results from a mismatch of environmental demands & individual profile of strengths and needs
* Perceptions of student ability and need is signaled through words, expectations, and supports and influenced by systemic (but sometimes unconscious) ableism

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| Big Idea 3 | Provide meaningful problem solving tasks |

* Benefits of contextualizing math instruction
  + Provide background information
  + Make learning truly “functional”
  + Make instruction meaningful & personally relevant
  + Opportunity to address multiple priorities
* Explicitly connect math to real world context
  + Videos
  + Word problems

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| Big Idea 4 | Anticipate barriers & proactively support independence |

* Independence in problem solving requires both conceptual understanding and procedural accuracy - Simply knowing what to do without when or why is insufficient
* Anticipate potential barriers in:
  + A chart with text on it

    Description automatically generatedNumeracy
  + Literacy
  + Executive functioning
  + Communication
  + Metacognition
  + Gross & fine motor skills
* Align supports to barriers
  + Conceptual Understanding
  + Procedural Accuracy
  + Access
  + Self-determination
  + Executive functions
  + Generalization
* Instructional strategies should align with the phase of learning
* Word problem solving is a natural opportunity to develop and apply social and emotional learning and self-determination

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| Related Resources |

**Blog:** Teaching Autistic Students to Solve Math Word Problems by Dr. Root in *The OARacle* <https://researchautism.org/oaracle-newsletter/40242-2/>

**Webinar Recording:** The Science of Math: Applying the Instructional Hierarchy with Learners with Autism and Intellectual Disability by Dr. Root for the Centre for Interdisciplinary Research and Collaboration in Autism at the University of British Columbia <https://youtu.be/klkOI7nwqaU?si=I5wBJQ68gMdM0Knl>

**Practitioner Article:** Jimenez, B., Root, J., Shurr, J., & Bouck, E. C. (2021). Using the four stages of learning to assess, set goals, and instruct. *TEACHING Exceptional Children*, Advance online publication: doi: 00400599211054873

**Practitioner Article:** Root, J. R., Saunders, A., Cox, S. K., Gilley, D., & Clausen, A. (2022). Teaching word problem solving to students with Autism and intellectual disability. *TEACHING Exceptional Children*, Advance online publication: doi: 00400599221116821

**Practitioner Article:** Root, J., Saunders, A., Jimenez, B., & Gilley, D. (2023). Essential components for math instruction: Considerations for students with extensive support needs. *TEACHING Exceptional Children*, *56*(1), 34-43.

*If you do not have access to TEACHING Exceptional Children, you can access PDFs of the articles at* https://bit.ly/3VSUUZR