



Using Mnemonics to Teach Science Content

What is the evidence base?

- This is an evidence-based practice for **students with disabilities** based on four methodologically sound group studies with random assignment across 153 students with disabilities.
- This is an evidence-based practice for **students with learning disabilities**, based on four methodologically sound group studies with random assignment across 145 students with learning disabilities.

Where is the best place to find out how to do this practice?

The best place to find out how to implement mnemonics to teach science concepts is through the following research to practice lesson plan starters:

- [Mnemonics to Teach Science Vocabulary \(King-Sears, Mercer, & Sindelar, 1992\)](#)
- [Using Mnemonics to Teach Minerals \(Mastropieri, Scruggs, & Levin, 1986\)](#)

With who was it implemented?

- Students with:
 - **Learning Disability (4 studies, n=145)**
 - Emotional Behavioral Disability (1 study, n = 7)
 - Intellectual Disability (1 study, n=1)
- Ages ranged from 12-15
- Males (n=113), females (n=40)
- Ethnicity
 - Caucasian (n=40)
 - African American (n=16)
 - None reported (n=97)

What is the practice?

Mnemonic instruction has been defined as a device, procedure, or operation that is used to improve memory. A variety of techniques have been developed to help tie new information to the learner's existing knowledge base and help with retrieval of information including keywords, peg words, acronyms, spelling mnemonics, and number sound mnemonics (Scruggs & Mastropieri, 1990). With this practice mnemonics were used to teach various areas of science content including:

- Science vocabulary on minerals and recall of facts (Mastropieri et al., 1985; Scruggs et al., 1985).
- Key word mnemonics for middle school science vocabulary instruction (King-Sears et al., 1992).
- Middle school science content including health and safety (Scruggs & Mastropieri, 1991).
- Middle school science vocabulary on dinosaurs and extinction (Veit et al., 1986).
- Picture mnemonics compared to direct instruction for science vocabulary instruction (Mastropieri et al., 1985).

Where has it been implemented?

- General Education classroom (2 studies)
- Special Education classroom (2 studies)

How does this practice relate to Common Core Standards?

- English Language Arts Standard for Literacy for Science and Technical Subjects (Grade 9-10)
 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics [CCSS.ELA-LITERACY.RST.9-10.4](#)
 - Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words [CCSS.ELA-LITERACY.RST.9-10.7](#)

How does this practice relate to the Common Career Technical Core?

Apply appropriate academic and technical skills.

- Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
https://careertech.org/sites/default/files/CCTC_Standards_Formatted_2014.pdf
 - Education and Training Career Cluster Standard 4: Evaluate and manage risks to safety, health and the environment in education and training settings

References used to establish this evidence base:

King-Sears, M. E., Mercer, C. D., & Sindelar, P. T. (1992). Toward independence with keyword mnemonics: A strategy for science vocabulary instruction. *Remedial and Special Education, 13*, 22-33.

Mastropieri, M. A., Scruggs, T. E., Levin, J. R., Gaffney, J., & McLoone, B. (1985). Mnemonic vocabulary instruction for learning disabled students. *Learning Disability Quarterly, 8*, 57-63.

Scruggs, T. E., & Mastropieri, M. A. (1991). Classroom applications of mnemonic instruction: Acquisition, maintenance, and generalization. *Exceptional Children, 58*, 219-229.

Veit, D. T., Scruggs, T. E., & Mastropieri, M. A. (1986). Extended mnemonic instruction with learning disabled students. *Journal of Educational Psychology, 78*, 300-308.

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