ABSTRACT
An overview of research that supports instructional practices for students with learning disabilities will be presented along with a demonstration of instructional materials developed as part of an NSF funded project to improve science learning of middle school students with learning disabilities (LD). Implications for inclusive science classrooms will be discussed.

MATERIALS FOR INSTRUCTIONAL PRACTICES

Science Notebooks
- Notebooks can be used in middle school content areas as a tool to build background knowledge (Rheingold, LeClair, & Seaman, 2013).
- Students with LD often have difficulty with organizational skills (Deshler, Ellis, & Lenz, 1996; Kim, Vaughn, Wanzek, & Wei, 2004).
- Notebooks were designed in binder form to provide organization and scaffolds that support student learning and serve as a “warehouse” of learning materials and resources.

Semantic Feature Analysis
- Use of graphic organizers (i.e., Semantic Feature Analysis) improve vocabulary and comprehension for students with LD in content areas (Anders & Bos, 1986; 1992; Bos & Vaughn, 2002; Dexter & Hughes, 2011).
- The use of graphic organizers helps students with LD build background knowledge that promotes learning of higher-level concepts in areas such as science (Dexter & Hughes, 2011).
- Semantic Feature Analysis was used as an interactive tool before, during, and after instruction to activate background knowledge, review content vocabulary, and compare and contrast energy sources.

Strategic Notetaking
- Strategic notetaking is effective for secondary students with LD to improve listening and notetaking skills (Boyle & Weishaar, 2001; Boyle, 2010).
- Students with LD benefit from explicit instruction to support comprehension of science text (Therrien, Taylor, Hosp, Kaldenberg, & Gorsc, 2011).
- Each notetaking sheet featured new vocabulary terms with corresponding picture cues. The teacher defined and discussed each term. Then the students wrote definitions on the notetaking sheet and described what would help remember each term.

Hands-on Learning
- Structured, hands-on experiential activities in science helps students with LD learn concepts more effectively (Scruggs, Brigham, & Mastropieri, 2013; Scruggs & Mastropieri, 2007).
- A solar oven made from a pizza box was used to demonstrate solar energy uses for cooking.

Multimedia
- Multimedia provides a means of creating instructional materials to convey content material, support student motivation, and meet student needs (Kennedy & Deshler, 2010; Mayer, 2011).
- A brief “breaking news” clip featuring the principal and assistant principal tasting delicious s’mores baked in the solar pizza box oven was created to support instruction and gain student interest during the first science lesson.

IMPLICATIONS FOR INCLUSIVE SCIENCE CLASSROOMS
- Providing access to multiple supports and resources empowered students to choose materials that would support their individual learning needs.
- Using notebooks with separate sections for each unit and the accompanying resources provided organization and structure, as well as a “warehouse” of materials that students used as a reference.
- Presenting science content in multiple ways can support learning for individual students.

REFERENCES