



Severe Disabilities

what to teach

COURSE
enhancement
MODULE

Math and Science

Objectives

The participant will be able to:

1. Identify early numeracy skills
2. Use graphic organizers to teach problem solving
3. Plan grade-aligned math
4. Develop an inquiry-based science lesson

Background Readings

Browder, D. M., Trela, K., Courtade, G. R., Jimenez, B. A., Knight, V., & Flowers, C. (2012). Teaching mathematics and science standards to students with moderate and severe developmental disabilities. *The Journal of Special Education, 46*, 26-35.

Browder, D.M. & Spooner, F. (Eds.), (2014). *More language arts, math, & science for students with severe disabilities*. Baltimore, MD: Paul H. Brookes Publishing Company.

Cihak, D.F., & Foust, J.L. (2008). Comparing number lines and touch points to teach addition facts to students with autism. *Focus on Autism and Other Developmental Disabilities, 23*, 131-137.

Davies, D.K., Stock, S.E., & Wehmeyer, M.L. (2003). Utilization of computer technology to facilitate money management by individuals with mental retardation. *Education and Training in Developmental Disabilities, 38*, 106-112.

Smith, B. R., Spooner, F., Jimenez, B. A., & Browder, D. (2013). Using an early science curriculum to teach science vocabulary and concepts to students with severe developmental disabilities. *Education & Treatment of Children, 36*, 1-31.

Materials for Participants

A novel material to use for the attention getter (e.g., an unusual rock or tool). (In a large group, you may need multiple objects for small groups to consider).

Materials for inquiry-based science role play- sponges for each group to have two sponges, pitcher with water

Access to internet to show a science experiment

Examples of a graphic organizer for mathematics. You can do an internet search for “graphic organizers” and find many examples in math. Here is one that you can find at www.attainment.com Search “Teaching to Standards Math”

Powerpoint on Math and Science. (Not provided. See background readings for resources to develop the powerpoint.)

Activities

Attention Grabber: To simulate inquiry-based learning, show the participants the novel object you brought. Have them use a KWHL chart. As they look at the object, they write what they know about it (e.g., it’s heavy, rugged). Then they list what they want to know about it. And brainstorm how to find out. When finished, they would list what they learned (not done in this activity). Here is a chart you might provide for this activity:

K: What I Know	W: What we W ant to Know	H: H ow to Find Out	L: What we L earned

Powerpoint: Present the powerpoint you developed on teaching math and science. Be sure to make it interactive with discussions and applications. For example, you might have participants write a task analysis for the steps to use a calculator to add two prices.

Math Story: Have students select a Common Core State Standard in mathematics and plan together how to teach it to students with moderate and severe disabilities using these steps:

1. Write a math story (e.g., Bob and John went to the donut store for a treat. Bob ate 5 donuts. John ate 3 donuts. How many donuts did they eat in all?)
2. Write the steps to solve the problem.
3. Decide what manipulatives students might use to solve the problem.

4. Design a graphic organizer to help students solve the problem. (show or provide examples of graphic organizers).

Science Inquiry Lesson: Have students role play a science inquiry lesson by doing an experiment on what makes rain. They will be learning the concept that “When clouds get heavy with water, it rains.” For the experiment, they try getting one sponge just slightly wet. The second sponge they immerse in their pitcher of water and watch it rain (water pours out bottom of sponge). Here are the steps:

1. Write the question “What makes it rain?”
2. Ask students to predict what will happen if they put a little water in the sponge and a lot of water in the sponge.
3. Do the experiment. Discuss what they observed.
4. Read the concept statement.
5. Now have students fill in the statement “When clouds get heavy with water, it ____.”

After the role play, have participants list what materials they would need for their students to do this lesson (e.g., response boards to fill in concept statement).