Math Education: Students with Significant Cognitive Disabilities

PowerPoint Slides
to be used in conjunction with the Facilitator’s Guide
Recommended citation:

This resource includes contributions from the module developer and MAST Module Project colleagues (in alphabetical order) Kelly Henderson (Facilitator Guide Editor), Tanner Jones (Web Designer), Diane Kester (Editor), Sue Byrd Steinweg (Project Director), Bradley Baggett (Graduate Assistant), and Sandra Hopfengardner Warren (Principal Investigator).
Session Agenda

• Introduction
• Session Goals and Objectives
• Research
• Alignment
• Story-Based Problems
• The Use of Graphic Organizers
Session Agenda, continued

• Task-Analytic Instruction
• Summary
• Evaluation
Introduction

• The Issue at Hand: Math instruction is composed of multiple strands of learning.
• Number identification and counting are only one area.
• Starting as early as kindergarten students are expected to begin building skills in geometry, algebra, data analysis, and measurement.
Introduction, continued

• Often students with significant intellectual disabilities have not yet mastered early level math skills (e.g., number identification, rote counting skills) in order to master higher grade-level objectives.

• This can pose a challenge when planning for math instruction aligned to grade-level standards for students with significant intellectual disabilities.
Introduction, continued

• Listen to description of LaTia at http://mast.ecu.edu/modules/sscd_mc/lib/media/photo1/SlideShow.html.
Activity - Introduction

• In groups, consider planning for a student like LaTia.
  1. What type of math skills should her teacher plan to teach LaTia?
  2. Is it appropriate to spend LaTia’s math instructional time working on the “next step: number identification 1-20 and rote counting to 20” only?
  3. Should LaTia be taught linear equations? Why or Why not?
Activity - Introduction, continued

4. What is one concern with LaTia’s instruction and teaching to the 8th grade standard?
5. Why would it be beneficial to teach LaTia to solve linear equations?
6. Think of one strategy that could be used to teach LaTia algebra related skills.
Activity - Introduction, continued

• Following small group discussion, listen to the audio narrative at http://mast.ecu.edu/modules/sscd_mc/lib/media/photo2/SlideShow.html
Session Goal and Objectives

• The **goal** of this session is to present the content standards of math and to generate an outline for math lessons based on a three-part strategy to access math state standards in all grade levels (K-12) for students with significant intellectual disabilities.
Session Goal and Objectives, continued

• The session will cover:
  – the national strands of math,
  – what grade aligned alternate achievement looks like in math,
  – a three-part planning process for math instruction, and
  – how academic math standards can be applied in everyday life.
Session Objectives, continued

Objectives: Participants will be able to:

1. Apply alignment criteria to determine well-aligned math instruction to state standards.
2. Identify the 5 content standards of math.
4. Select a graphic organizer to use to solve the SBMP.
Session Objectives, continued

5. Identify a task analysis to meet a math standard objective.

6. Identify a 3 step planning strategy to generate grade-aligned math instruction.

7. Select applications to classroom contexts (i.e., given scenarios) to increase grade-level aligned math instruction for students with significant intellectual disabilities.
Research

• We’ll start by reviewing what we already know about teaching math to students with and without disabilities.
• When planning instruction, base it on evidence-based research practices.
• Think about LaTia;
  – to plan instruction that is linked to the grade level standards, we must understand what teaching linear equations means, and know instructional strategies to teach those skills.
Research, continued

• To learn more about research based practices and the national standards in math watch the slide show at [http://mast.ecu.edu/modules/sscd_mc/lib/media/photo3/SlideShow.html](http://mast.ecu.edu/modules/sscd_mc/lib/media/photo3/SlideShow.html).

• Copies of the slides follow.
Math Instruction for Students with Significant Intellectual Disabilities (SWSID)

• What do we already know?
Academic Research

• At the time of IDEA 1997, fewer than 10% of studies with students with severe disabilities focused on academics (Nietupski, Hamre-Nietupski, Curtin, & Shrikanth, 1997)

• At least 10 studies indicated Ss with severe ID learned math skills of time; money (Browder & Grasso, 1999)
Mathematics Components Addressed in Studies Completed with Students With Significant Cognitive Disabilities

- Other, 7
- Count, 9
- Match, 9
- Calculate, 12
- Time, 3
- Money, 33
- Other, 2
- Other, 2
- Other, 2

Numbers and Operations | Measurement | Algebra | Geometry | Data Analysis
--- | --- | --- | --- | ---
Calculate, 12 | Time, 3 | Other, 2 | Other, 2 | Other, 2

Focus on the Big Ideas of Math

• Content Standards in Math
  – Numbers and operations
  – Algebra
  – Geometry
  – Measurement
  – Data analysis/probability

http://www.nctm.org/
Number and Operations

Instructional programs from prekindergarten through grade 12 should enable all students to--

- understand numbers, ways of representing numbers, relationships among numbers, and number systems;
- understand meanings of operations and how they relate to one another;
- compute fluently and make reasonable estimates.
Algebra

Instructional programs from prekindergarten through grade 12 should enable all students to--

- understand patterns, relations, and functions;
- represent and analyze mathematical situations and structures using algebraic symbols;
- use mathematical models to represent and understand quantitative relationships;
- analyze change in various contexts.
Geometry

Instructional programs from prekindergarten through grade 12 should enable all students to--

- analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- apply transformations and use symmetry to analyze mathematical situations;
- use visualization, spatial reasoning, and geometric modeling to solve problems.
Measurement

Instructional programs from prekindergarten through grade 12 should enable all students to--

- understand measurable attributes of objects and the units, systems, and processes of measurement;
- apply appropriate techniques, tools, and formulas to determine measurements.
Data Analysis and Probability

Instructional programs from prekindergarten through grade 12 should enable all students to--

- formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- select and use appropriate statistical methods to analyze data;
- develop and evaluate inferences and predictions that are based on data;
- understand and apply basic concepts of probability.
• Play the video of Dr. Dave Pugalee at http://mast.ecu.edu/modules/sscd_mc/lib/media/pugalee1.html.
How Do We Make Math Accessible?

- Focus on the big ideas within math
- Use concrete manipulatives to compensate for cognitive challenges
- Relate math to familiar activities from daily life….but beyond money and time
- Use evidence based practice
Problem Solving

Instructional programs from prekindergarten through grade 12 should enable all students to--

- build new mathematical knowledge through problem solving;
- solve problems that arise in mathematics and in other contexts;
- apply and adapt a variety of appropriate strategies to solve problems;
- monitor and reflect on the process of mathematical problem solving.
Activity - Research


• Pay special attention to the tab at the top of the “Standards and Focal Points.”
  – One challenge to teaching math, especially in upper grades, is the content. As special educators, we often are not as familiar with the math standards and how they are taught.
Activity - Research, continued

- Working with general education teachers is a great strategy for gaining content knowledge and strategies. Becoming knowledgeable about resources available is another way.

• Learn more about the Curriculum Focal Points in math (specific focal points can be found in the Table of Contents of the publications in the Curriculum Focal Points series). These focal points are often called the “Big Ideas” in math.
Alignment

This is a model for “Aligned Instruction”. To have strong instruction aligned to the state standards it is important to make sure the curriculum (e.g., IEP, state standards, instructional programs) match with what is really being taught in the classroom, the instruction. Finally, once the instruction and the curriculum match, students should be assessed on the same content and skills.
Alignment, continued

• Let’s look at an example of an extended standard for 6th grade math.
  – Table 1 which illustrates the grade level achievement Competency Goal and Objectives; and below that is the Extended Standard written for students working on alternate achievement standards. Students with significant intellectual disabilities need instruction in math linked to the general curriculum standards with an alternate achievement standard.
Competency Goal 3: The learner will understand and use properties and relationships of geometric figures in the coordinate plane.

Objectives:

3.01 Identify and describe the intersection of figures in a plane.
3.02 Identify the radius, diameter, chord, center, and circumference of a circle; determine the relationships among them.
3.03 Transform figures in the coordinate plane and describe the transformation.
3.04 Solve problems involving geometric figures in the coordinate plane.

Extended Standard: Demonstrate and describe examples of the intersection of figures. Solve problems involving circles (center and circumference) and related segments (radius, diameter, chord).

<table>
<thead>
<tr>
<th>Symbolic Access Points</th>
<th>Early Symbolic Access Points</th>
<th>Pre-symbolic Access Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Demonstrate ability to communicate the intersection (touch) of two figures.</td>
<td>• Demonstrate knowledge of the number of points of intersection (touch) for two figures.</td>
<td>• Demonstrate awareness of intersection (touch) points for two figures.</td>
</tr>
<tr>
<td>• Demonstrate understanding of two intersecting figures.</td>
<td>• Demonstrate knowledge of the center, and circumference of a circle.</td>
<td>• Locate the interior of a circle.</td>
</tr>
<tr>
<td>• Communicate the center, circumference, radius, diameter and chord of a circle using correct mathematical terminology.</td>
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</tr>
</tbody>
</table>
Alignment, continued

- These types of content standards help delineate and prioritize the instructional efforts of teachers for students.
- North Carolina has also provided symbolic access points to their extended standards to help provide instructional access to each standard for all students.
Alignment, continued

• Based on the standard above, let’s take a minute to look at an example of aligned instruction for LaTia. Remember, we want to make sure that our instruction for LaTia matches with the standard in *content and performance* (as much as possible).
# Aligned Instruction for LaTia

<table>
<thead>
<tr>
<th>General Education Expectation</th>
<th>Example of Student Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State Standard:</strong>&lt;br&gt;The learner will understand and use properties and relationships of geometric figures in the coordinate plane.</td>
<td>Option 1: LaTia will complete an eight piece puzzle by orienting the shapes in the correct locations.&lt;br&gt;-Content? NO&lt;br&gt;-Performance? NO</td>
</tr>
<tr>
<td><strong>Extended Standard:</strong>&lt;br&gt;Demonstrate and describe examples of the intersection of figures.</td>
<td>Option 2: LaTia will identify intersecting figures located in a coordinate plane.&lt;br&gt;-Content? YES&lt;br&gt;-Performance? Some</td>
</tr>
<tr>
<td><strong>Content:</strong>&lt;br&gt;Intersection of geometric figures in the coordinate plane.</td>
<td>Option 3: LaTia will identify the point of intersection between two figures located in a coordinate plane and describe an example.&lt;br&gt;-Content? YES&lt;br&gt;-Performance? YES</td>
</tr>
<tr>
<td><strong>Performance:</strong>&lt;br&gt;Demonstrate and describe.</td>
<td></td>
</tr>
</tbody>
</table>
Alignment, continued

• In Option 1 LaTia is completing a puzzle to assess the geometry standard.
  – This is not a good example of how LaTia is working on instruction linked to the content or the performance.
  – Orienting shapes of a puzzle does involve geometric shapes, but does not have anything to do with the intersection points of the shapes or coordinate places.
  – This is most likely not a skill taught in 6th grade either.
Alignment, continued

• Option 2 begins to align to the content but:
  – Is still is not a very good example of performance linked to a grade level standard.
  – LaTia is being asked to identify figures that intersect each other, but not the place of intersection.
Alignment, continued

- Finally, Option 3 is an example that is aligned to both the content and performance.
- It is important when aligning instruction that both the content and performance (as much as possible) match the state standard.
- Now, look at standard on following slide and think of an example that is aligned to both content and performance.
<table>
<thead>
<tr>
<th>Subject: Algebra</th>
<th>Grade Level: 9-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competency Goal 3: Data, Analysis and Probability: The learner will collect, organize and interpret data with matrices and linear models to solve problems.</td>
<td></td>
</tr>
<tr>
<td>Objectives:</td>
<td></td>
</tr>
<tr>
<td>3.01 Use matrices to display and interpret data.</td>
<td></td>
</tr>
<tr>
<td>3.02 Operate (addition, subtraction, scalar multiplication) with matrices to solve problems.</td>
<td></td>
</tr>
<tr>
<td>3.03 Create linear models for sets of data to solve problems. Interpret constants and coefficients in the context of the data. Check the model for goodness-of-fit and use the model, where appropriate, to draw conclusions or make predictions.</td>
<td></td>
</tr>
</tbody>
</table>

Extended Standard: Collect, organize, and display data to solve problems (goal is to use graphs and data – scatter plots, bar graphs, line graphs, tally, stem and leaf plots, pictographs, Venn diagrams, circle graphs, line plots, tables).

Consider and write down:
What is the content? __________
What is the performance? __________
Alignment, continued

• The content is data to solve problems.
• The performance is to collect, organize, and display.
  – When math instruction is aligned to grade level standards it will include all four - solve problem, collect, organize, and display.
  – Not all students will be able to collect, organize, and display the data.
Alignment, continued

– It is important to try to include all three performance standards if possible; this is the extended standard written for students with significant cognitive disabilities.

– If a student is not yet able to do all three performance skills, it may be appropriate to introduce each skill one at a time, building skills throughout the school year.
Alignment, continued

• Consider the example:
  – Would it be a well-aligned skill to ask LaTia to look at a bar graph and indicate which column has “more”. Does it match in content?
  – Yes, it does match the content.
  – Does it match in performance?
  – No, it does not match the performance. LaTia needs to build the skills to collect, organize, and display data.
Alignment, continued

– A better example would have been for LaTia to collect information from her peers or family to create the bar graph. Then using the bar graph data, LaTia would indicate which column has “more” to answer a question.
Story-based Problems

• Now we are ready to learn more about creating math lessons. We have already reviewed:
  – how to make sure the skills we plan to teach are aligned to grade-level standards;
  – research on teaching math and the national standards (NCTM).

• We will now review a process to build your own standards-based math lessons, based on research by Browder et al., 2010.
Story-Based Problems, continued

• The first step is to use stories to build context in mathematics.

• Let’s look at a model for teaching grade-aligned math instruction to students with significant cognitive disabilities. Watch the slide show introducing story-based math problems at http://mast.ecu.edu/modules/sscd_mc/lib/media/photo4/SlideShow.html.
Story-Based Math Problems

pdclipart.org
A Model for Math lessons

Personal Relevance - Story + Graphic Organizer + Task-Analysis = Math Lesson

Project MASTERY IES Grant # R324A080014 UNC at Charlotte

http://mast.ecu.edu
• Let’s now learn more about the 1\textsuperscript{st} bubble on Story-Based Lessons.
• Watch the video of Dr. Dave Pugalee at http://mast.ecu.edu/modules/sscd_mc/lib/media/pugalee2.html.
Story-Based Problems, continued

Story–Based Math Problems

Friday night with David

David went to the mall with his sister on Friday night.

They planned to see a movie, shop for shoes, and eat dinner.

First, they ate dinner. When they were all done eating and shopping, they saw a movie. What was the last place they went to before they saw the movie?
The learner will recognize and use standard units of metric and customary measurement

Objectives:

• 2.01 Estimate the measure of an object in one system given the measure of that object in another system.

Extended Standard: Measure objects in different ways or with different tools
Story-Based Problems, continued

• We have seen a sample math story and written one together to align to a 5th grade measurement standard.

Story-Based Problems, continued

• Pay special attention to the different levels of adaptations and modifications the teachers makes to assure that all of her students are actively participating in the reading of the story.
Story-Based Problems, continued

• Video Recap: In the video, a high school teacher read a story about a class voting on what book has been their favorite.
  – The teacher used the story to embed the data or facts.
  – The teacher read the story while students read along with her.
  – Students identified the facts in the story as the read, as well as the problem “What book was voted the favorite?”
Story-Based Problems, continued

• Did you notice the various different ways students participated in this portion of the math lesson?
  – Some students read along with the teacher independently;
  – Others were prompted by the teacher to locate the important information in the story (e.g., *Lord of the Rings*);
  – Other students had one-to-one assistance (e.g., paraprofessional, peer) read with them.
Story-Based Problems, continued

– This video is a great example of group instruction designed to meet each student’s individual needs.

• Math instruction requires many new terms for students. It may be helpful to review common terminology that will be used in the lesson.

• Make sure that students understand what is being asked in a lesson.
Story-Based Problems, continued

• An example is the term "X" in algebra. Students will need to know that an X is used for unknown facts or numbers in algebra, in order to "solve for x".

• Watch video at http://mast.ecu.edu/modules/sscd_mc/lib/media/vocab.html. The teacher is reviewing pictures and new vocabulary for an upcoming lesson in geometry (from Teaching to the Standards: Math by Attainment Company).
Story-Based Problems, continued

• Video Recap:
  – The middle school teacher reviewed the vocabulary that will be used in the upcoming geometry lesson. Did you notice the format of the vocabulary words?
  – They were all presented as written words and picture symbols, which increases the student’s comprehension of each word.
Story-Based Problems, continued

• Often students with severe disabilities are taught to identify sight words.

• While this is a worthy skill, it is also important to make sure that students gain understanding of those terms.

• One strategy is to teach students to match vocabulary words to pictures or definitions that represent the concept.
Activity - Story-Based Problems

• In pairs, select a state standard in math and practice planning a math lesson to teach this standard.
• Begin by creating a math story. Consider ways to create a math story for a general or extended standard as shown and discussed in the video examples, including use of written words and picture.
• This story will be used in activities later.
The Use of Graphic Organizers

• The use of graphic organizers is a great way to help students organize the facts of the problem.

• Think about the sample story we wrote to address the measurement standard. Does our story have a sequence of events?

• Let’s review our story:
• LaTia wants to hang a picture on the wall in her room. She wants to make sure that the picture is not too big to fit on a small wall in her room. She needs to measure the picture and measure the wall to decide if the picture will fit.

• First she decides to measure the picture, then will measure the wall. The picture is 12 inches wide and the wall is 18 inches wide. Will the picture fit on the wall?
Use of Graphic Organizers, continued

• Consider having students recreate the picture out of red construction paper and the wall out of blue. They will need to actually practice the skills of measurement this way.

• Once they have measured the items, they can lay the picture on the wall to see if it will fit. In this sample lesson, the actual construction paper may be a form of graphic organizer.
Use of Graphic Organizers, continued

- Watch the video at http://mast.ecu.edu/modules/sscd_mc/lib/media/facts.html to see how a teacher directs her students to find the facts in an algebra story and place them on their graphic organizer (from Teaching to the Standards: Math by Attainment Company).
Use of Graphic Organizers, continued

• Video Recap:
  – A high school teacher taught a lesson in algebra in which the students are solving for X to solve a problem about “how many gift certificates Irene needs to buy.”
  – The students in this video were asked to locate the facts in the story.
  – The teacher re-reads the story to allow the students to locate the facts in the story.
Use of Graphic Organizers, continued

– As students locate each fact they record them into the algebra graphic organizer.

– This graphic organizer was created to allow students to organize the 1st fact, unknown fact, and last fact.

– Using another graphic organizer (number line) the students then were able to count up or down to solve the equation.
The students did not need to answer verbally to find facts and record the answer.  
– Some students may be able to point to the facts in the story and record the answers using a pencil/paper format;  
– Other students may have Velcro numbers in the story they take off and place into their graphic organizer.
Use of Graphic Organizers, continued

• It is important to think about the mode of communication students currently have (e.g., pointing, pull-off, use of augmentative communication device) and use that mode to allow students access to the skill being taught.
Activity - Graphic Organizers

- Continue with planning a math lesson using the story problems developed in the previous activity.
- Select vocabulary to be taught.
- Then create a graphic organizer to teach the skill.
Task Analytic Instruction

• In the video, the students go through a process to start to solve the algebra equation. They had already read a story, identified what the problem of the story was, and were beginning to identify the facts of the story and place them on their graphic organizer.

• They were following a task analysis to solve a math problem.
Task Analytic Instruction, continued

• A task analysis is created when you break down a chained skill. An example is teaching a student to tie their shoe:

  1. Hold each lace.
  2. Cross laces over each other.
  3. Pull one lace through the other.
  4. Make a loop in one lace.
  5. Wrap 1 lace around the loop.
  6. Pull the lace through the hole where thumb is.
  7. Pull both loops tight.
Task Analytic Instruction, continued

• *Task Analytic instruction* in mathematics provides students with a process to solve any math problems.

• The next video demonstrates the same teacher and students completing the final steps in the task analysis to solve the algebra math problem.
Task Analytic Instruction, continued

• Notice the teacher reviews the problem statement at the end of the lesson.

• It is essential that students have an opportunity to build math problem solving skills by answering the story question (e.g., 2+X=6; *How many pieces of pizza did Jason need to buy for his party?* 4. Jason had 2 pieces and he needed to buy 4 more.)
Task Analytic Instruction, continued

• Watch the continuation of the algebra instruction video at http://mast.ecu.edu/modules/sscd_mc/lib/media/solve.html.
Task Analytic Instruction, continued

• Video Recap:
  – In the video, did you notice how the students used the number line in the graphic organizer to solve for $x$?
  – The students did not need to currently have counting skills or even number recognition skills to solve the equation. They did have some number recognition skills but needed the number line to help them solve the equation independently.
Task Analytic Instruction, continued

– Did you notice what the teacher did once the students solved for $x$?

– She went back to the question from the story. It is important to bring the students back to the main idea of the story. They were solving this algebra equation for a reason: to find out how many gift certificates Irene needed to buy.

– Students used the numbers and their answer to answer the “real-life” problem.
Task Analytic Instruction, continued

- The UNC Charlotte’s General Curriculum Access grants website at http://education.uncc.edu/access/2009Curriculum_Summit.htm includes examples of math elementary school, middle school, and high school task analyses.
Task Analytic Instruction, continued

• You may notice different versions of the math task analysis.

• They are primarily the same steps; however, it is important to consider vertical differentiation across the school years.

• In the high school task analysis there is an extra step in with students independently identify what graphic organizer needs to be used to solve the problem, rather than the teacher handing them a graph to sort data.
Task Analytic Instruction, continued

• It may be unreasonable to expect all students to follow all steps of the task-analysis independently.

• Teachers will need to prioritize which, if not all, steps on which specific students are working towards mastery.
Task Analytic Instruction, continued

• Recognize the opportunity for students to participate in more steps within the process as mastery occurs, as well as the need to consider strategies to allow students to participate in steps that may not follow a traditional method.

• Consider the following questions and possible answers:
Task Analytic Instruction, continued

• How might a student who is non-verbal share the problem of the story?
  – One way might be through assistive technology supports.

• How can a student identify the facts of the story?
  – One way might be by using a voice-output device with numbers records on it.
Task Analytic Instruction, continued

• How can a student count up to find the missing fact of an equation?
  – The student might use a number line.
  – The students might activate a step-by-step voice output device to count until the teacher touches the “last fact.”
Activity - Task Analytic Instruction

• Continue with planning a math lesson using the story problems, vocabulary and graphic organizer they developed in the previous activities.

• Create a task analysis for the skill they are instructing.

• After completing the task analysis, role play the math lesson.
Activity, continued

• Be sure to include all steps of the task analysis (story, vocabulary instruction, finding the facts, solve problem). Materials you will need are:
  – Math story
  – Graphic Organizer Vocabulary cards
  – Math Task Analysis
  – Manipulatives (as noted by graphic organizer)
  – Assistive technology devices (as appropriate)
Summary

• Math instruction for students with significant intellectual disabilities should include instruction that is grade-aligned to math standards in the area of algebra, geometry, data analysis, numbers and operations, and measurement.

• Using a story-based math approach is a strategy that can be used to provide students a personally relevant context to learn math.
Summary, continued

• Graphic organizers provide students a means to organize facts in math and can be used across all grade levels to teach a wide variety of math skills.

• Finally, the use of systematic instruction, specifically a task-analysis, can be used to break down the steps of the math problem, allowing students to gain mastery of each step and become more independent.
Focus and Reflection Questions

1. How can educators adapt the "story-based" approach to mathematics for students who may respond better to "limited language" or less verbal directives?

2. Based on the module, references, and comments of Dr. Dave Pugalee, why is it important to teach mathematics using a context rather than "drill and test" the discrete skills?
Focus and Reflection Questions, continued

3. Some students with moderate to severe disability may not have mastered early numeracy skills (e.g., number identification, rote counting) before gaining access to grade-aligned mathematics instruction (e.g., perimeter, algebra), how can educators serve students in an individualized manner, while maintaining the requirements of grade-appropriate instruction?
4. Brainstorm ways that story-based math instruction could be incorporated into an inclusive math classroom (e.g., 4th grade), what types of supports would be necessary? Would all students benefit from learning math in a context, why? How could the principles of UDL support math instruction?
Application and Extension Activities


   - Identify the lesson plan of choice, using the lesson plan, identify how students with significant cognitive disabilities would be able to participate “show what they know” in the lesson.
Application and Extension Activities, continued

- Refer to the MAST modules on UDL, especially the *UDL: Introduction* module to think about how to adapt the lessons based on Representation, Expression, and Engagement.

- Identify 1-2 adaptations that could be made for students with more intensive response needs (e.g., assistive technology, adapted materials) based on each component of the lesson plan found.
2. Using the link to the Evidence Based Practices for Math from the Resource Guide at http://www.ksde.org/LinkClick.aspx?fileticket=oUV9LtYHYdo%3D&tabid=2384&mid=9027, read the manuscript and select one peer-reviewed journal article (annotated bibliography) to implement in your own classroom, practicum or internship.
3. Web search - Create a list of 8-10 lesson plan sources that could be used to plan grade-aligned math instruction. As special educators, you may not be as familiar with math content. One strategy is to work with general education science teachers in person or via the Internet to gain content knowledge.
Application and Extension Activities, continued

• Variations of assignment:
  – Web search list – with sample documents from each source
  – Web search list – list of what each site offers
  – Web search based on specific topic of interest (e.g., fractions), finding several resources to work from, or sample lesson plans, videos, student games
Self-Assessment

• A self-assessment with response feedback is available at http://mast.ecu.edu/modules/sscd_mc/quiz/. Participants may take this assessment online to evaluate their learning about content presented in this module.
Session Evaluation

• A form for participants to evaluate the session is available in the Facilitator’s Guide.