Teaching to Standards: Math

Supporting active participation of students who access curriculum at a presymbolic level

Students who access the curriculum at a presymbolic level may not have basic numeracy skills (e.g., numeral identification, rote counting, one-to-one correspondence, recognition of picture symbols, or awareness of written language). Students should access curriculum, appropriate for their age and grade level, in a way that allows them to continue to build numeracy skills. Students may "show what they know" in multiple ways:

- Verbally respond (or vocalize in some way)
- Point to or touch an object or symbol
- Eye gaze toward a response
- Grasp an object
- Use an alternative or augmentative communication (AAC) device

It is important to identify and use the student's current method of communication (e.g., pointing) when measuring responses to academic responses, while at the same time building on new communication responses (e.g., using an AAC device or a yes/no response) in the lessons. *Teaching to Standards: Math* was written to promote active participation of ALL students. Multiple opportunities are available in the curriculum to help students build academic skills as well as communication skills. The following chart provides some ideas for actively involving students who are at a presymbolic level in a math lesson.

Remember, not all students will complete all steps of a lesson at an independent level; however, ALL students should be expected to work toward independent responses that align to grade-level curriculum.

Skill	Description of skill	Example access points
Develop number sense	Will match numerals	• Match a numeral to the same numeral on the number lines in the Measurement and Algebra units • Match a given numeral to the same numeral versus a non-number • Identify a number on a graph
Develop one-to-one correspondence and rote counting	Will activate an AAC device, tap, or use objects to count with one-to-one correspondence	• Activate an AAC device to the count of 3 • Count objects to 5 • Activate an AAC device to the count of 10 • Activate an AAC device to count and stop counting when you or a peer stop counting • Indicate when to stop placing dollars on the number line (e.g., activate a switch to say "more," "that is enough," "stop") • Place objects on the graph to indicate the number of objects indicated in the story (e.g., place real DVDs on the large poster-size graph to correspond to the numbers in the story) • Tap on the poster-size graph while you or a peer counts up

Build vocabulary and symbol use	• Will choose a real object represented in a story
	
	• Will match a real object to a photo representation of the object
	
	• Will match a real object to an illustration of the object
	
	• Will match text to a picture
		• Given two objects, choose the one related to the story problem
		
		• Match a story-related object to a photo representation (a real orange to a photo of an orange)
		
		• Match a story-related object to an illustration of the object
		
		• Follow a tactile representation of a story problem (e.g., trace a map of a mall and a plane outlined with yarn)
		
		• Comprehend and use one vocabulary word per unit (vocabulary chosen specific to the student). Examples:
		
		  ○ Identify "last" fact in algebra equation by eye gazing to the number)
		
		  ○ Identify a "line segment" by drawing a line, choosing an image of a line segment, or tracing a line segment with a finger
		
		  ○ Identify "most" by counting with one-to-one correspondence

Skill	Description of skill	Example access points
Build prerequisite skills	Will develop money skills	• Choose money from a non-money item • Count dollars using "next-dollar" strategy • Identify a dollar versus the change in the story problem
	Will develop basic concepts related to time	• Identify a number (with prompting such as a highlighted number, an arrow pointing to the number, or a tactile number) on a clock from the Algebra story • While you and peers count, start and then stop a digital clock when it reaches the number in the story problem (e.g., 2 pm)
	Will develop prerequisite sequencing skills	• Identify "first" and "last" in a row or line in the classroom
Personal relevance	Will match objects to pictures	• Identify objects from a story (e.g., DVD, sandwich, ham; you may need to adapt the stories to relate to persons and events immediate to the student) • Match objects to picture representations
	Will use a method for communicating	• Answer questions based on events in the math story using objects and pictures (e.g., Did Nancy and Richard sing on American Idol or dance on Dancing with the Stars?) • Answer yes/no questions using some form of communication (e.g., a head nod, an AAC device, a blink to indicate no and smile to indicate yes, an eye gaze, a hand grasp)
Solve math problems	• Will identify the problem statement using real object representations • Will identify the problem statement using picture representations of the problem	• Select an object, paired with the picture symbol, from a choice of 2 to 4 objects to indicate the problem statement (e.g., Pavel needed to know how much money he needed to buy a sandwich; student chooses between a real sandwich and a real book to indicate the problem statement)
Functional community skills	• Will identify familiar people, places, things, and activities in the classroom math lesson • Will generalize activities in the community	• Identify an object found in a mall or grocery store • Recognize familiar places in the community (e.g., a movie theater) • Move from one location to another (during a simulated lesson in the classroom or during an actual math lesson applied to the community) • Identify familiar people from stories you develop

Skill	Description of skill	Example access points
Natural supports	• Will work with a peer to solve a problem • Will practice solving math problems with the support of a paraprofessional	• Choose a response given options from a peer • Choose a response given options from a paraprofessional
Self-determination and independence skills	Will show self-determination by making choices related to the math lesson	• Indicate preferences for a story problem by choosing a story (via objects) to solve • Write one's own story by choosing who the story is about, what numbers are used, and what objects are involved; one or two choices are provided