

LET'S GO TO THE VIDEOTAPE: ASSESSING NUMBER KNOWLEDGE

Key Focus: Mathematics

Observation: *Play Video "Let's Go to the Videotape"*

Reflecting on the Documentation: **Participants may quickly shift from reflecting on the documentation to interpreting the observation or suggesting strategies for extending learning. Remind participants to discuss the advantages and disadvantages of the documentation technique.*

Ask: What advantages does video documentation provide in this situation?

Sample Responses: This video captures an assessment of children's understanding of number and counting strategies. By taping this interaction, the teacher is free to spend her time focused on the child's responses without having to worry about taking notes. The teacher can go back later to write down any documentation or review any part of the assessment she chooses. In this way, she may pick up on strategies or responses that she might have otherwise missed. Video documentation is also helpful because it gives concrete evidence of children's abilities that can be shared with families and other teachers. In many cases it will also document the child's approach to learning—showing how attentive the child is to the task and different cues the child gives for how he or she feels about the task and the questions. Moreover, videotaping at the beginning and the end of the year creates a powerful record to demonstrate children's growth over time.

**Play the video clip a second time.*

Ask: What did you notice the second time you watched this video that you did not see the first time?

Sample Response: Answers may vary, but perhaps the strategy that the child used for counting is now more evident.

Ask: Once the video is made, how can Ms. Copley review it and record the information?

**List ideas on chart paper or a whiteboard.*

Sample Responses: Ms. Copley might go back and watch the videos and create a short narrative written summary for each child documenting (1) the knowledge that each child has about numbers and (2) the counting strategies (for example, touches or moves each object when counted; uses fingers to represent numbers) that each child uses. *(This is not a very efficient way of documenting the information, so try to encourage discussion of other ways to organize the information.)* She might create a checklist for each child that allows her to track what quantities the child counts to with one-to-one correspondence. For example:

	1	2	3	4	5	6	7	8	9	10	11	12	13
Malachi													
Diana													
...													

Or to track skills and strategies, she might create a record form highlighting the strategies of interest to her:

	Counts touching cubes using 1:1 correspondence	Tells 1 more without counting (N+1)	Counts in sequence	Can state number of units without counting	Cardinality –can state how many total	Uses fingers to represent numbers correctly (1:1)
Malachi	3, 4, 5	Showed on fingers: 3+1 and 4+1	1 to 10	No	Recounts or shows fingers	4, 5
Diana	5, 9, 9 , 9, 10, 11, 13, 14	9+1 10+1 13+1	1 to 29 (then said “twenty-ten”)	5	Yes	--
...						

She may want to add a section for notes so that she can capture other information. For example, note that Diana did not answer correctly when asked about adding two more ($N + 2$); she might also add Diana could not tell what number came after 100.

When a child has not yet been asked to do one of the tasks (such as representing a number on his or her fingers), the teacher might indicate by “–” or by “NA”. The teacher might put a number and cross it out if the child responded incorrectly. See above where the teacher drew a line through the second number 9). Remember Diana counted to 10 instead of nine when she was asked to check the first time.

The teacher might also add a column for recording other strategies for counting that she notes children using independently or with assistance (moving the objects, grouping the objects). She could have a list with the typical ones numbered and then she would not need to write out each time she saw a strategy used—or she might want to know when children selected different strategies – for example, moving an item when there are more things to count and they are not lined up.

Interpretation of the Observation: **Remind participants that in their interpretation they are looking for patterns, critical incidents, or errors. It is important to stick to the data. Participants may also suggest new questions (hypotheses) to be examined.*

Ask: What does this video reveal about Malachi's number sense and strategies?

Sample Responses: When presented with three blocks, Malachi counted them by physically touching them. He did so with one-to-one correspondence. He showed how many block there were with his fingers, again with one-to-one correspondence, but did not independently say how many there were, even after the modeling by Ms. Copley. He did repeat the number that she said. He immediately showed that "one more" means adding a finger, again demonstrating understanding of one-to-one correspondence and of "one more." We do not know how well he does with larger numbers. He also used his fingers to respond to answers as a first strategy, rather than words. He had difficulty remembering the word "eleven." The teacher may question whether he has trouble finding words in other contexts. It is not clear that he understands that the last number counted tells how many total (the cardinality principle).

Ask: What does the video reveal about Diana's number sense (her ability to use and understand numbers) and strategies?

Sample Responses: The second child, Diana, was able to immediately identify the number of unifix cubes (5) without needing to physically count (*this is known as subitizing*). It is unclear if she was able to make an immediate decision because the cubes were laid out in a familiar pattern (cubes were in a dice pattern), if she counted along with the investigator as she placed them out, or if she was able to quickly recognize small quantities. When challenged to count again, Diana counted 10 blocks when there are 9. One wonders whether she thought she was asked to recount because she was wrong the first time (note how she hesitates before recounting the last block). When asked to make a third attempt, to reconcile the difference, she used the strategy of physically picking up each of the cubes to make sure she has accounted for each one. She demonstrates understanding of the concept of "one more" each time she is asked; however, when asked about "two more," she answers incorrectly with the next number (one more).

Relating Your Observation to the Child Outcomes Framework:

**Although participants can defend other interpretations, there should be general consensus that this observation demonstrates:*

3A1-3/6 (Mathematics/Number and Operations): Demonstrates increasing interest and awareness of numbers and counting as a means for solving problems and determining quantity; Begins to associate number concepts, vocabulary, and quantities in meaningful ways; Develops increasing ability to count in sequence to 10 and beyond; Develops increased abilities to combine, separate, and name “how many” concrete objects.

6A3 (Social & Emotional Development/Self-Concept): Demonstrates growing confidence in a range of abilities and expresses pride in accomplishments

Next steps for large group instruction:

**Help participants make connections between what they learn from the assessment and the next steps they want to take in instruction. If suggestions for instruction extend activities to new areas of learning, ask participants to consider what aspects of children’s progress they would assess and how they would do so during those extension activities.*

Ask: What would you recommend that the teacher do next for the class as a whole?

**Responses will vary but might include:*

- In large group you might introduce the game of dominos to help children understand the relationship between number symbols and quantities, and determining them immediately by shape. This way children do not always need to count elements but can quickly see how many objects are present.

Next steps for individualized instruction:

Ask: What would you recommend that the teacher do next for individual children?

** Responses will vary but might include:*

- For Malachi, the teacher might practice rote counting to 20 more frequently. She could continue to ask him “how many” for small quantities. She could remind him that the last number you say when counting tells how many there are in total. She might have him match the things he is counting to the number on a number line as he counts them. She might create number puzzles where he has to match a puzzle piece with a number written on it to another puzzle piece that displays a quantity of items equal to that number (for example, match a puzzle piece with the number “3” written on it to a piece that shows three fish). This would help him match quantity to the written number and support practicing naming numbers.
- For Diana, the teacher might begin to think about helping her to count “two more.” The teacher might check to see if Diana can count backwards from 10, or from 20. Can she tell how many there are if you take away one?

Additional
Notes:

When using videos, check in with your center about any regulations or confidentiality forms that parents might need to sign before showing the videos to others (such as other teachers or other parents and children).

You might use the videos you collect in teacher study groups or in parent-teacher conferences. With teachers, the videos can be used to generate discussion of what children know and what the next steps for their instruction might be. With parents you can show them changes in their children's development from the beginning of the year to the end.

Moreover, you don't need to use video just in formal assessments and teaching interactions. For example, walk around the classroom with your video camera and try to capture children in the dramatic play area. By capturing children's stories on tape you can then show the children videos of themselves and use this as a stepping-off point for them to elaborate on their stories and revisit their work. You can also videotape children in the art area and later ask children to comment on their work and ask them what they were thinking when they created particular paintings or drawings.