

Assessing & Developing Math Concepts



Stay Connected!

Kathy Richardson is the author and developer of the Assessing Math Concepts (AMC) series of assessments and the Developing Number Concepts (DNC) series for Kindergarten through Second Grade Mathematics. Kathy, Program Director for Math Perspectives, is one of the most respected early childhood mathematics educators. Kathy answers questions from teachers across the country who are using AMC and DNC.

If you have questions for Kathy, please send them to Math Perspectives at info@mathperspectives.com.

INSTRUCTION: Best Practices

Q I need some guidance on best practices when using activities in the classroom. - *Potomac, MD*

A There is a lot to know about best practices when teaching math. I can direct you to resources that will help you if you are interested in learning more. In the meantime, I will let you know some things to consider.

When our goal is for children to understand the math they are doing, we want to avoid having them memorize procedures and answers. We want to give them experiences that will allow them to learn what happens with the numbers when they count, compare, combine or break apart numbers. Children need a variety of experiences dealing with a concept, and multiple experiences over time. To get a better picture of what that would look like, read the information in the Developing Number Concept book that focuses on the concept you are going to be working on. In each chapter, there are Classroom Scenes which describe children doing activities and the teacher interacting with them.

You can find a list of activities from the Developing Number Concepts (DNC) books that will provide appropriate experiences for the instructional levels identified through each assessment. The list of activities can be found on the AMCAnywhere site; however teachers can find a bit more information about using these activities on the assessingmathconcepts.com website. Look for the tab at the top of the page titled "Resources" and then open AMC documents. There is a Linking document for each assessment. The documents also include references to other resources that can provide information about best practices for using the activities. The book *Time for Math* (a revision of *Math Time: The Learning Environment*) has information about what it means to teach for understanding and gives very practical information on

how to set up the classroom, how to get children actively engaged in the activities, how to meet the range of needs within the stations and so on.

The National Council for Teaching Mathematics has a list of best practices that aligns with Developing Number Concepts that can be found [on their website].

I hope this is helpful. Let me know if you have any further questions. ~ *Kathy*

NUMBER TALKS

Q I've read that the learning environment during a Number Talk should be safe for all students. What are some things I can do to be sure I'm creating a safe environment? - *Houston, TX*

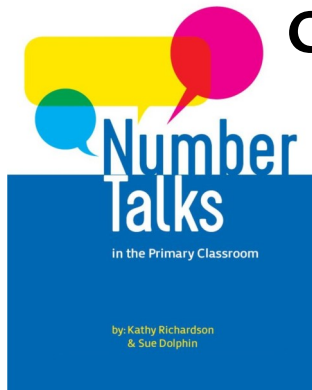
A A Number Talk is a time when students are asked to solve problems in their own ways, using the math they know so far. For children to be engaged and willing to find their own ways to solve problems, they must feel safe and trust that the teacher and other children will accept what they say without judgment.

Teachers can create this environment when they treat the Number Talk like a conversation, rather than a performance. When sharing their thinking, instead of receiving praise or criticism, students learn that what they think matters and is of interest to those listening. They see that a safe environment is not one where students do not make mistakes, but where it is okay to make a mistake. It is not an environment where everything is easy, but where struggling with something hard is respected.

In *Number Talks in the Primary Classroom*, we list four signs of a safe environment:

1. The children are willing to share, even if their answers are different from everyone else's (including the one in the class who has the reputation of always being "right").
2. The children understand that what is wanted is an honest account of what they did to arrive at their answer. The children give responses that match what they actually did instead of responses that imitate what someone else did or said or what they think the teacher wants to hear. They are engaged in making sense, noticing relationships and finding answers for themselves-not to please the teacher.
3. Children recognize when they make a mistake and are eager to explain where their thinking went wrong. You will hear children saying things like, "I changed my mind. I think it is 42 not 52. I forgot to take the 10 away." Or, "I know what I did wrong. I made the 7 a 5 and a 3 instead of a 4 and a 3."
4. Children may ask questions, but they don't make remarks or use body language to show they think another child's answer

was wrong or the method was unsophisticated. They are not asked to signal agreement or disagreement because that is a public demonstration of what others think about another child's ideas. When a child has a wrong answer and the other children are not signaling agreement, it becomes a failure, rather than a natural part of any discussion where everyone is trying to figure things out.



Coming in 2020!

If you're interested in receiving information on scheduling a Number Talk course, or to purchase your copy of this book in advance, please email Sheryl Russell at: Sheryl@mathperspectives.com

ASSESSING MATH CONCEPTS: Number Arrangements vs Hiding Assessment

Q I am a Math Coach. One of the first grade teachers I coach believes they can skip the Number Arrangements assessment and begin with the Hiding Assessment. What is the reasoning for assessing students with Number Arrangements before the Hiding Assessment? This teacher's rationale is that you can assess both to see if students see parts of numbers within the Hiding Assessment. I am a content teacher and would like the research answer behind the rationale of doing number arrangements first, then progressing through AMC to eventually getting to the Hiding Assessment. - *Gastonia, NC*

A Number Arrangements and the Hiding Assessment give us different information about children's understanding of parts of numbers. Children develop an understanding of number composition and decomposition in relatively predictable ways. Number Arrangements identifies where children are in the stages that come before what is assessed through the Hiding Assessment. The Number Arrangement Assessment is a fairly quick assessment which gives lots of information about where children are

in their development of understanding of parts of numbers. Children begin seeing numbers as collections of single objects. They see 6, for example, as 1 and 1 and 1 and 1 and 1 and 1 and do not see parts. As long as they are at this level, they will count to get answers to addition problems. Eventually, they will see that numbers are made up of parts. Recognizing the parts also develops in a predictable sequence. Children will see groups of 2 first and then groups of 3 within numbers to 6 and later within numbers to 8 and then 10. They will also begin to see groups of 4 and sometimes 5s within parts to 8 and eventually, they will be able to see some arrangements of 5 or 6 within numbers to 10.

Once they can identify the parts of numbers, they will move through stages for finding the total. First, they find the total by counting all the dots. Later they will count on to find the total and eventually they will combine the parts without counting.

A benchmark report for all students in First Grade in a district or school will show who is seeing parts but still counting to find the total and who can combine parts without counting all. During the first part of the year, the majority of First Graders are still counting all to add. Some are able to describe the parts of the arrangements, but many others are still not seeing parts for all the cards used.

The Hiding Assessment requires the child to know that numbers have parts, but they must know those parts so well, they can identify a missing part when they know one part. This is much harder than looking at a whole arrangement and describing and combining the parts within it.

By the time children are assessed with the Hiding Assessment, we are looking for more than what parts they know. We want to see who can use relationships to figure out an answer, who knows how many when 1 is hiding but not when all but 1 are hiding, how knowing $3 + 4$ can help them know $4 + 3$ and even $3 + 5$.

I hope this is helpful. Please let me know if you or the teacher you are working with have any further questions. - *Kathy*

If you're using Assessing Math Concepts and have a question regarding any of the nine assessments, we'd love to hear from you. Please email us your question to info@mathperspectives.com.



If you are using the paper Student Interview forms and would like to receive information on the Web-based version or professional development, please contact us at info@mathperspectives.com.