

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.

DEVELOPING MATH CONCEPTS: GETTING STARTED and SELF-DIRECTED EXPLORATION

Q What do you name the kind of exploration in which we set up stations with a particular mathematical topic such as subtraction? I want the teachers to experience both the above kind of exploration AND the "self-directed exploration". Do you have a recommendation about which teachers should do FIRST with their students? - *Erving, MA*

A So good to hear from you. The self-directed exploration is the time where children work with materials using their own ideas. Not only do they naturally work with mathematical ideas, but they learn the expectations of the classroom as well as how to make choices and how to work hard. The children really need this time to work with the materials in their own ways and time to learn what is expected of them during stations. Giving them this time ensures the success of the stations. Without it, you will find it is more difficult for the students to really focus on the tasks, work hard, and learn all that they can learn.

The self-directed exploration time evolves into Independent Station Time. I don't think of it as exploration per se, because there are specific tasks to be done at each station. The tasks are "expandable" so every child can work at their own level. Children make choices about which station to go to and how long they stay at each station.

You can get more details about this from the *Time for Math: Creating a Learning Environment That Works for All Students* book and some information in the *Developing Number Concepts Planning Guide*.

Hope things are getting off to a great start. Stay in touch!
~ *Kathy*

DEVELOPING MATH CONCEPTS: WHY THE 0-99 CHART vs. 1-100 CHART?

Q Why do you use the 0-99 chart with Developing Number Concepts instead of a 1-100 chart? - *Las Vegas, NV*

A There isn't one way to organize numbers to 100, but I have come to prefer the 00-99 chart. The main reason I like to use the 00-99 chart is that each row starts with the number of tens instead of ending with the number of tens so when you look down the first column, you see 10, 20, 30 and so forth. Each row then starts with a number of 10s (like 30, for example) and continues with the whole 0-9 sequence ending with that number of tens plus 9 (39). It is just a nice pattern that emerges.

The children in my classroom worked with the Grouping Games. When we started working with tens, they added one at a time to their place value boards and recorded each step eventually ending up with 9 tens and 9 on their boards and the 00-99 chart as a record of what they had counted. At the time I was working with Mary Baratta-Lorton (*Math Their Way*) who developed the Grouping Games, there was a lot of emphasis in the math community on number patterns that emerged from various situations. One of the issues was that zero was often an important step in the various patterns we were exploring, so including 0 tens and 0 was also a way of including zeros.

The 00-99 or 1-100 charts are mainly useful for displaying the number patterns that are a natural and helpful part of the number system. ~ *Kathy*

ASSESSING MATH CONCEPTS: COUNTING

Q1 I am working with several kindergarteners who have to start at 1 every time they count even if they are counting to 2. I have used the DNC activities for years, but this group just isn't making gains with the activities. Could you suggest anything additionally I should be doing? We have been in school 2 months and they have core math and interventions in math with no gains and obviously I need to do something differently. Thank you. - *Altamont, KS*

A1 Thank you for reaching out with a question. I have some thoughts about this group of children, but I need more information about what they know and can do before I can be more specific. If these children are getting intervention services in addition to math time in your classroom, my guess is that they struggle with other areas as well as math? Is this true? If so, that might mean that counting is not meaningful to them yet. I imagine that you and the interventionist are trying very hard to help this group of children

make as much progress as possible. Sometimes what happens is the children know you are expecting them to do something and they are trying to figure out what that is. They may be watching you and the interventionist to see what to do rather than figuring out what counting is about for themselves. If a teacher was trying to make sure they counted 1 to 1, they may have modeled or led the children to start with 1 and carefully touch each object as they count. This might also be followed with, "Let's check and see." We can inadvertently lead children to think they are always supposed to start with 1 to make sure they are right. Children can learn to do what they are asked to do this without understanding they are finding out how many. So the first thing I would do is back off on showing them how to do it "right." You will have a better idea of what they are thinking if you just observe for a while.

I suggest you work with them using Grow and Shrink (in Book One: 1-8) and carefully observe how they handle this. Start with numbers less than six. So, you might say, "Show me 3 counters." Then say, "I changed my mind. Show me 2 counters" Continue asking them to show you numbers and just watch. Don't correct them. See if they remove the counters and start over every time. I assume they will. Are they able to count out 2? 3? 4? or more? See if they look at you or the other children before counting. Do any of them try to copy others?

If you would let me know how they handle this, I will have a bit more information on which to base some suggestions.

I look forward to hearing from you again soon. ~ *Kathy*

Q2 I did the Grow and Shrink with the three students with the most needs. Two of the three just piled cubes on and randomly took them off and had no idea if they reached the "target" number or not. Obviously, numbers themselves lack meaning. The third student was interesting to me because he would be changing Example: 2 to 5 and he would count the 2 and then touch the empty dots and say 2, 4, 5, and then put cubes on 3-5. Verbally he is successful but when adding a dot or number dice (I tried both just to see) he has no idea about what the number he is needing is. I think he may have a reading problem more than anything else, but am not sure about this yet. Thank you for your wonderful advice. I love the DNC materials and want to make sure I am getting the most I can from these math experiences for the students. - *Altamont, KS*

A2 I see that it is clear that two of your children are not yet able to deal with quantities. I think when you do instruction, you should have them work with numbers up to 4.

I am reminded of a kindergarten student I had who also had little understanding of numbers. I wanted her to participate in the stations along with the other kids. I gave her a

card with 4 dots. She was to put one block or toothpick or cube on each dot. Then she could build a design with whatever material she was using. I did that to help her "be one of the kids" but what happened was she started to realize that 4 would always be the same and she started to understand what counting was. You might do something similar but maybe even start with 3 dots. Another thing they can do is build on the Counting Boards. They could have their card with 3 dots to help them put 3 cows in each corral or 3 apples on each tree.

See if they can work with that support.

I will be interested to see if they can 1) follow these directions and 2) if they can eventually show you 2 or 3 or even 4 when you ask them to.

About the boy who is able to touch the dots and get the right number of cubes... That is actually pretty good work for kindergarten. As long as he has a strategy for finding out, that is fine right now. What I would be curious about is whether he can tell you he put 3 more on the grow and shrink board or if he answers with the total saying something like "I put 5."

I think he lacks confidence to some extent but he may not really be all that needy. Is he a serious child who doesn't like to make mistakes? If so, that could be what is making him try to do what he thinks the teacher wants rather than just thinking for himself.

Let me know what happens in a few weeks or email me questions at any time. ~ *Kathy*

ASSESSING MATH CONCEPTS: HIDING ASSESSMENT

Q I am a Math Coach. This school year we decided to split screener 6 (Hiding Assessment) into 2 parts for first grade. Screen parts of 6 and 7 in October and parts of 8, 9 and 10 in April. The screener takes a long time to complete and the data would be useful in the fall of first grade.

We have twelve K-5 schools in our district. A level of P or A is acceptable on a screener. We use the online version of Assessing Math Concepts and the program passes a child along if they have an A - if they are a P, the child goes back a level. Is there a way to continue with a P and not have to end the program and go back in to the next number family?

Also, if teachers need to end and then reopen the screener each time, there is no class report that has all the data. It is only the latest family. Where is all the data in one class summary? I hope this is clear. - *Evanston, IL*

A I would like to give you some background information about why the Hiding Assessment is set up as it is. We want to find out which number combinations the child knows without counting and which combinations they still need to

learn. So, the program is set up to go to a smaller number if the child is not "ready to apply." It is definitely progress for a child to "need practice" if they had previously been unable to figure the answer out, but it is also an indication they still need to work with the combinations for this number longer. I hope those children who do not do well on 6 will be assessed with smaller numbers so you can get the most accurate information about their instructional needs.

Since you are using it as a screen to find out what the students know about 6 and 7, the only way you can be sure to have the results show up on the same Instructional Report is to start with 7 and then go back to 6. Otherwise, to see all the results you would have to export the data. There is information about how to do that online at AMCAnywhere.com where you can find the AMC Anywhere User Guide under the Support tab.

If you would like any further information about the assessments and how to use the information, please feel free to contact me with your questions. ~ *Kathy*

ASSESSING MATH CONCEPTS: COUNTING OBJECTS

Q I am leading a class related to the use of your Assessing Math Concepts Book #1 in my school, and some of the teachers had a question that I, too, was wondering about. We use the paper/pencil version of Assessing Math Concepts and our question is how did you decide the organ-

ization of the columns for Task 1 and 2? Why is 32 in its own column, and then 21, 12 and 7 in the middle column, and 12 and 7 in the last? Thanks for answering our wondering question. - *Gahanna, OH*

A I can see why the columns are confusing to you. This is the thinking... The way we designed the form, I could only fit 3 columns on the page. So I tried to arrange the choices to fit all scenarios. If you started with 32 and the child was not able to count that many successfully, you could then choose 21, 12, or 7 depending on what the child did. If you chose 21 and the child was not successful, you could choose 12 next. Or if you determined by the way the child counted 32, they needed to go to a much smaller number, you could choose 12 or even 7. If the child was unable to count 12, you could choose 7. But if you had chosen 7 instead of 12 and the child was successful, you could choose 12 for the last column. This may sound complicated, but it works for most sequences.

I didn't know how to explain it when I created the form, but you could suggest teachers cross out the numbers I put in and make up their own sequence. They need to know the choices are 32, 21, 12 and 7. I used to suggest starting with 32 because that is how I did it in my classroom, but since the forms came out, I think most teachers and children feel better about starting with 21.

I hope this makes sense to you. At least, you can see there was some logic behind it. Let me know if you have any other 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.

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