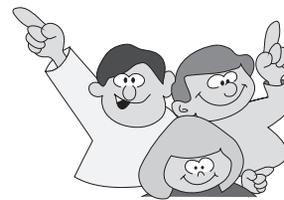


Assessing Young Children's Understanding of Mathematical Concepts Using Interviews and Technology

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How do we get an accurate picture of what young children know and can do in mathematics? This question is one that primary teachers across the nation face daily. The book *Mathematics Assessment: A Practical Handbook for Grades K–2* states:

The phrase "to assess" comes from Latin and means "to sit beside." In primary grade classrooms, we learn most about how our students learn when we sit beside them, engage them in conversations, observe their actions, read their reflections, and see their mathematical work.

Many students in primary grades have difficulty expressing themselves mathematically with numerals and symbols, and actually know more mathematics than a written test shows. In an interview assessment, we can get a more accurate picture of each child's understanding. One-on-one interviews conducted by the teacher provide invaluable information about what each child knows and understands.

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Kathy Richardson has developed an excellent collection of nine assessments that focus on key concepts that need to be in place if children are to understand and be successful in mathematics. These assessments are detailed carefully in each of the nine *Assessing Math Concepts (AMC)* books: *Counting Objects*, *Changing Numbers*, *More/Less Trains*, *Number Arrangements*, *Combination Trains*, *Hiding Assessment*, *Ten Frames*, *Grouping Tens*, and *Two*



Digit Addition and Subtraction. This continuum of assessments can be used as a tool that determines what young children already know and what they need to learn in mathematics.

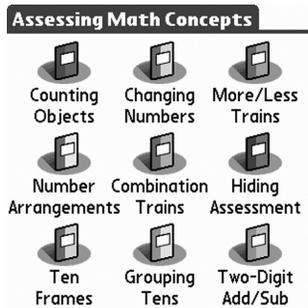
Each of the books in the series has the same introduction, which provides the teacher with background information and an overview of each of the assessments. There are suggestions about which assessments are most appropriate for children from Pre-kindergarten through third grade, and how to use these assessments as interventions in the classroom.

After the Introduction, each book then focuses on one specific assessment. Suggestions for how to conduct the student interview, examples of student interviews, and information about how to use the individual recording forms are clearly articulated, and form the basis of this section. In addition, there are Class Summary Sheets to help teachers meet the instructional needs of all the children in the classroom. Each book closes with ideas for linking this assessment with instruction.

The books provide a student-friendly way for the teacher to probe the understanding of each child. The knowledge gained becomes the basis for small group lessons that pinpoint the edge of each child's mathematical understanding. Using these publications to peek inside a child's mind provides an ongoing, formative assessment of mathematical understanding.

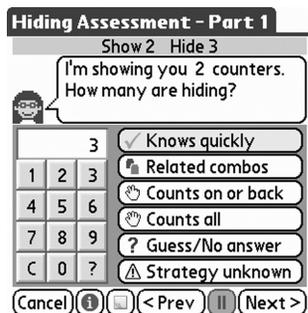
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The assessment books are a “stand alone” tool. In the past few years, however, the electronic version of these assessments has been made available. Originally used on the Palm Pilot, all nine assessments are now available and ready for the teacher to use with a computer. Dubbed *AMCAnywhere*, the digital assessments are meant to be used in conjunction with the Assessing Math Concepts series.

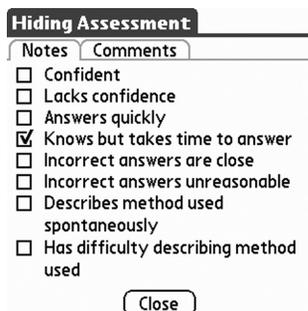


The beauty of using the computer is that the screen prompts the questions the teacher is to ask, and lists possible responses. Based on the child’s responses, it either asks a more difficult set of questions or an easier set to find that child’s edge of understanding.

A sample screen from the Hiding Assessment follows.



The assessment also has a checklist for teachers to note student responses. The comment section can be used to write anecdotal observations.



Another advantage of this type of assessment is that reports of the data are numerous and immediately helpful to the teacher in planning whole group, small group, and individual instruction. The teacher can choose from the following options: Student Detail Report, Student Progress Report, Class Instruction Report, Class Summary Report, and Benchmark Report by Student. For the latter report, school districts, schools, and teachers can set their own benchmarks throughout the year.

Kathy Richardson has used her expertise in working with young children to develop an outstanding continuum of assessments. Though these assessments can work with many mathematics programs to enhance instruction, the *Developing Number Concepts* books written by Kathy are most useful in planning instruction that closely ties with her assessments. In each assessment book, and also in each electronic assessment, there are specific links to activities from the *Developing Number Concepts* books that target specific areas of need for individual and small group instruction.

To find out more about these assessments, go to www.mathperspectives.com or www.didax.com and click on AMCAnywhere.

References

Richardson, Kathy. *Assessing Math Concepts*. Bellingham, WA: Mathematical Perspectives, 2003. (Note: There are nine books in this series and they are listed in the article.)

_____. *Developing Number Concepts, Book 1: Counting, Comparing and Pattern*. Parsippany, NJ: Dale Seymour Publications, 1999.

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Stenmark, Jean Kerr, Florence Glanfield, and William S. Bush, eds. *Mathematics Assessment: A Practical Handbook for Grades K–2*. Reston, VA: National Council of Teachers of Mathematics, 2003.



This chart outlines what children are capable of understanding at 3, 4, and 5 years of age. Number concept. At 3 years children may: At 4 years children may: And find out how to incorporate math concepts in story sharing. From Early Childhood Today. Article. Mathematical thinking comes naturally to young children and can develop substantially during the early years. Here, Sarama and Clements discuss how to help children explore and expand their math skills. From Early Childhood Today. Privacy Policy Terms of Use. One-to-one interviews have been used extensively in Australia by both researchers and teachers to assess young children's mathematical understanding. This chapter discusses the use of a one-to-one... Cite this chapter as: Clarke B. (2015) Assessing Young Children's Mathematical Understanding: Opportunities and Expectations at the Transition to School. In: Perry B., MacDonald A., Gervasoni A. (eds) Mathematics and Transition to School. Early Mathematics Learning and Development. How Should Young Children be Doing Mathematical Problem-Solving in the Future? We believe that the answer to this question lies in three areas that focus on the early introduction of mathematical ideas, the use of technology, and engagement. Early introduction. Several researchers have promoted the idea of introducing mathematical ideas earlier in the curriculum and even introducing the foundation of advanced mathematical thinking in the early grades (Kaput, Carragher & Blanton, 2008; Kaput, 1994). If not then, many children will never be exposed to important mathematics and engage in fruit