



Focus on Numeracy – Structuring Number 1-10

A KCM Publication for Preschool & Primary Grades Teachers and Families

ISSUE 3

Things to try

Stick dots to paper plates making a standard domino pattern on each plate. Flash the pattern for $1/2$ a second and see if students can “subitize” – that is, instantly know the quantity without counting, sort of like sight-words in reading. Do the same with irregular dot patterns for the numbers 1-5. Advance the challenge by using color coding to delineate a group of five from additional dots and ask students to tell the amount of each color and the total.

Flash ten frames that have dots arranged in 5-wise patterns (that is, 5 across in one row and some more on the other row). Ask the child to tell how many are on the top, how many are on the bottom, how many dots there are altogether, and how many squares are empty. Do the same for pair-wise dot patterns arranged by doubles and doubles ± 1 . Also, create ten frames that have all the squares filled with dots of 2 colors showing 5-wise and pair-wise partitions of 10.

So that a child may realize that fingers can show partitions of 5 and 10, ask him/her to show a number and tell how many fingers are up and how many are down. Talk about all the different ways to make 5 with some fingers up and some down. Do the same for making 10. Ask the child to show on their fingers different ways to make each number 3-8. See if the child is able to flash the combinations or must count from one.

Tell a child that you have a number less than 5, but you wish you had 5 and ask him/her to find how many more you need. Repeat for all combinations to make 5. Do the same with missing addends to make 10.

What is structuring number in the range 1-10?

From the Dutch, structuring involves combining and partitioning numbers without using count-by-one strategies and leads to robust quantitative reasoning. Facile structuring to 5 and 10 makes a strong foundation for advanced mental computation and number sense.

Resources

- Wright, Stanger, Stafford, and Martland. (2006). *Teaching Number in the Classroom with 4-8 year-olds*. Chapter 5. Paul Chapman Publishing.
- Fosnot and Cameron. (2008). *Games for Early Number Sense*. Heinemann .
- Interactive Ten Frame from the National Council of Teachers of Mathematics. <http://illuminations.nctm.org/ActivityDetail.aspx?ID=75>
- *Dots-Fingers*, one of the many free printable *Early Years Mathematics Activities and Games* from Manitoba Education and Literacy, recommended by Mathematics Intervention Teacher, Kris Jarboe. <http://www.edu.gov.mb.ca/k12/cur/math/games/index.html>

Upcoming issues of *Focus on Numeracy* will follow the KCM Mathematics Intervention Teacher Collegial Professional Learning Framework, *Journey to Numeracy for All*, based upon a child's numeracy development, as drawn from the Math Recovery teacher growth program developed by Bob Wright. To facilitate student progress teachers and families are encouraged to provide opportunities for children to experience all the aspects of number: number words, written symbols, and quantity.

September – *Emergent counting*

October – *Perceptual counting*

November – *Structuring to five and ten*

December – *Figurative counting*

January – *Structuring to twenty*

February – *Tens and ones*

March – *Advanced addition and subtraction*

April – *Early multiplication and division*



The goal of the Kentucky statewide mathematics diagnostic intervention program is to expand the capacity of teachers to diagnose student need and to adjust instruction accordingly. More specifically, the program provides high quality training and sustained support for job-embedded professional teacher growth in:

- Understanding the **complexities** of mathematical concepts from the earliest grade levels.
- Awareness of and ability to support the **natural progression** of mathematical development.
- Ability to **pinpoint student need/readiness** for learning mathematics using diagnostic/formative assessments that show what a child can do (**an asset model**) and what instruction is needed for advancing his/her thinking.
- Building a strong mathematical foundation and flexible advanced mental **computation skills** by facilitating students' opportunities for deep thinking, both silently and aloud, in order to **make sense of mathematics**.

<http://kentuckymathematics.org>

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