Session #142

Billett and Williams

The Right Tool for the Job

A Progression for Dots in a Row

(Supporting Rational Counting and Early Addition)

Phase 1 (Establishing the numerosity of a collection)
Show enough dots to allow for counting practice in the desired range. Cover the rest with a piece of paper. Have the child count the visible dots, touching each dot as s/he says the number in the sequence.

Phase 2 (Establishing the numerosity of a collection)
Have the child practice counting small collections by placing the counters on the dots as s/he says each number in the sequence.

Phase 3 (Create a collection of a given size.)
Direct the child to put a particular number of counters on the dots.

Phase 4
Turn the mat over. Have the child practice counting small collections by placing the counters on the dots as s/he says each number in the sequence.

Phase 5
Put out 1-5 red counters and 1-5 blue counters. Have the child place them on the mat and determine the total number. Extend the range of numbers in the first group as the child becomes more comfortable.

Phase 6
Put out 5-10 red counters on the mat and cover with a piece of paper and then place 1-5 blue counters. Keep the blue counter visible. Have the child determine the total number. Extend the range of numbers in the first group as the child becomes more comfortable.

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A Progression for the Rekenrek

Phase 1: Meet the Rekenrek

This activity should be used the first time students use rekenreks. Allow ample time for free exploration of this tool and then ask the following questions;

- What did you notice about the rekenrek?
- How many beads did you see? What colors do you see?
- How did you count the beads? Did anyone count them another way?
- How do you think you will use this tool?

Establish the norms for using the rekenreks. The beads always begin on the right side and as they are used, move to the left. So all students are using the rekenrek colored beads in the same way, it might be helpful to place a sticker in the upper right had corner of the rekenreks.

Phase 2: How Many Do You See? How Do You See Them?

Push various numbers to the left and ask the students to quickly tell how many beads they see. Start with 1, then 5, 7, 9, 12, 16, etc. Ask students how they know how many they see and listen for answers that involve visualizing 5 and 10, or seeing doubles, as opposed to counting individual beads.

Phase 3: In 1 Push

Reinforce the idea of showing a number on the rekenrek in "one push." Say a number and ask students to show that number in "one push." Ask students to explain how they knew they were pushing the right number. Notice reasoning that involves visualization of 5s and 10s, as well as doubles.

Phase 4: In 2 Pushes

Reinforce the idea of showing a number on the rekenrek in "two pushes." Say a teen number and ask students to show that number in "two pushes." Ask students to explain how they knew they were pushing the right number. Notice reasoning that involves visualization of 10 and some 1s.

Phase 5: Make This Number

Use numeral cards from 1-20. Hold up a card at random and ask students to show that number on their individual rekenreks. Debrief various solutions and how students arrived at the position of beads. Notice the number of pushes students use to show their numbers. Encourage students to think about "chunking" their numbers by using the fewest number of pushes.

Phase 6: What's The Missing Number?

Play a team class game by pushing some of the top rod of beads and the class pushes the bottom set of beads to make the chosen number, e.g., To make 9, push 5 red beads to the left from the top row. Students push 4 on the bottom rod. Look and listen for strategies.

A Progression for Bead Strings
(Supporting Composing and Decomposing Numbers)

Phase 1
Using a 2-colored 10 bead string, show quantities in the range 2-5 in the middle of the string and using both colors.

Phase 2
Give or show students a number in the range 1-5. Have them describe the different ways the beads could be configured. Example: 4 could be described as 3 black plus 1 white OR 2 black plus 2 white OR 1 black plus 3 white OR 4 black OR 4 white.

Phase 3
Show some beads. Ask how more of the other color, are needed to make the target number (in the range 1-5). Example: Show 3 black beads. Ask "How many white do I need to have 5 beads?"

Phase 4
Give word problems about the bead string without actually using it. Examples: "I have 3 black beads and 1 white bead. How many beads do I have?" and "I have 2 black beads. How many white beads do I need to have 4 beads?"

Phase 5
Show the first 5 plus the next 1. "How many beads do you see? How do you know?" Continue with showing 5 and 2, 5 and 3, etc.

Phase 6
Show the first 5 beads of the string. How many more do we need to have 6? 7? 8? 9? 10?