Session 2: Using Mental Images to Intentionally Develop Number Sense and the Power of Making Student Thinking Public

Goals:

Teachers will be able to carry out number talks (with symbols, ten frames, and Rekenreks) focused on various benchmarks of numbers.
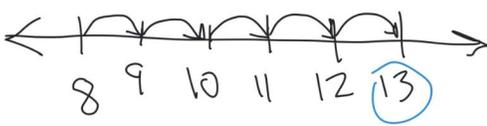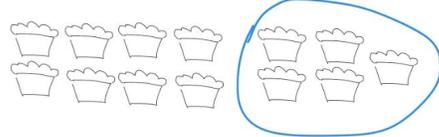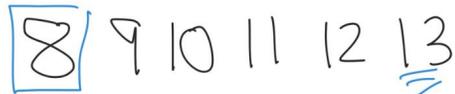Teachers will be able to develop recording tools to make student thinking public.
Teachers will be able to identify the critical learning phases that are addressed in various number talks.
Teachers will be able to highlight various properties of numbers as they design number talks that ask children to compose and decompose numbers.

Commenting on Student Work - Session 2 (http://goo.gl/forms/yYWQcl2BVDAe1FeU2)

Alison has 8 cupcakes. Quentin gives her some more cupcakes for the party, now Alison has 13 cupcakes. How many cupcakes did Quentin give Alison?

Strategies for Join (result unknown)

A. Write word problem for $9 + 6 = ?$

B. Direct Modeling (related to counting all)

C. Counting (count on)

D. Derived Fact (Number Sense) - Find at least 4 different strategies.
   Describe strategies using number strings.

"Make-a-ten" for Addition

There are three prerequisites for children to use the make-a-ten strategy effectively (From Fuson Ch. 6 in Research Companion page 74):

1. They must know what number makes a ten with each number up to 10 (e.g. 10=9+1, 8+2, 6+4 or 7+3)
2. Be able to break a number apart into any of its two addends (e.g. 8 = 5+3 so that when they do 8 + 7 they can then do 5+3+7 = 5+10 = 15)
3. They need to know that 10 + n = 1n (e.g. 10 + 7 = 17)

How does the ten-frame below highlight each of the prerequisites above?
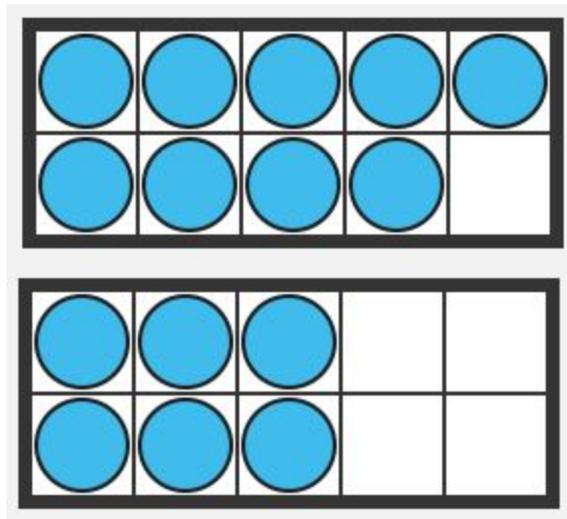
Watching Alyssa and Shannon (1st grade)

Dot Patterns	Recording Strategies	
	Alyssa	**Shannon**
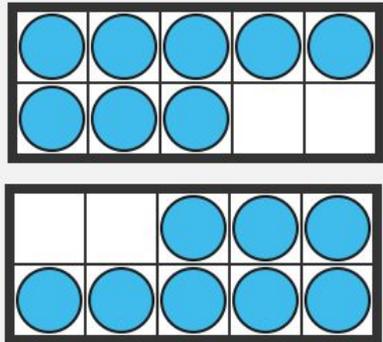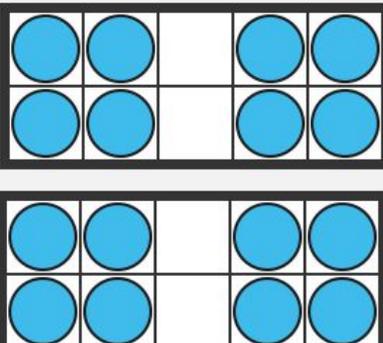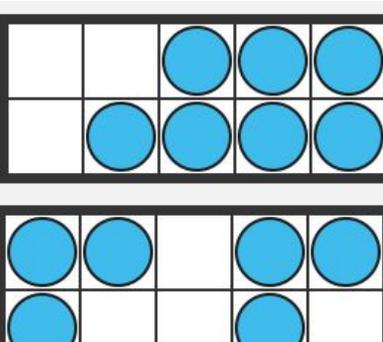
What was the intent behind the talks?

Why might the teacher have selected the numbers/dots she did?

What strategies did the teacher use to keep all kids engaged? *(A quote from equity training: "The evidence for teaching is learning. Learning happens through engagement. Engagement happens through making connections.")*

What moves did the teacher make during the course of the talk?

How did the teacher represent student thinking?

What was the focus of the conversation-- what things did the teacher "value" in the talk?
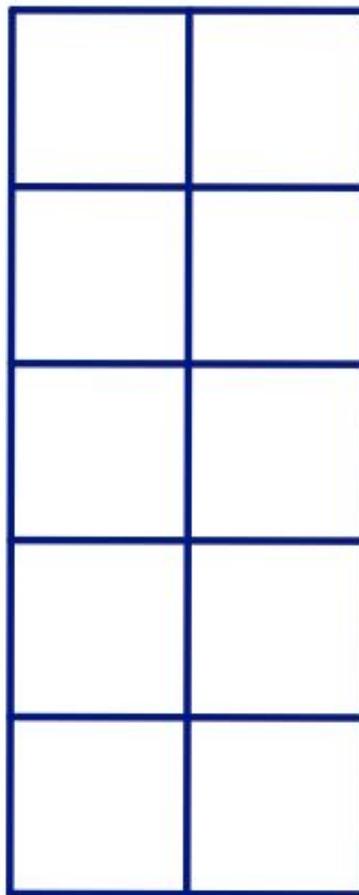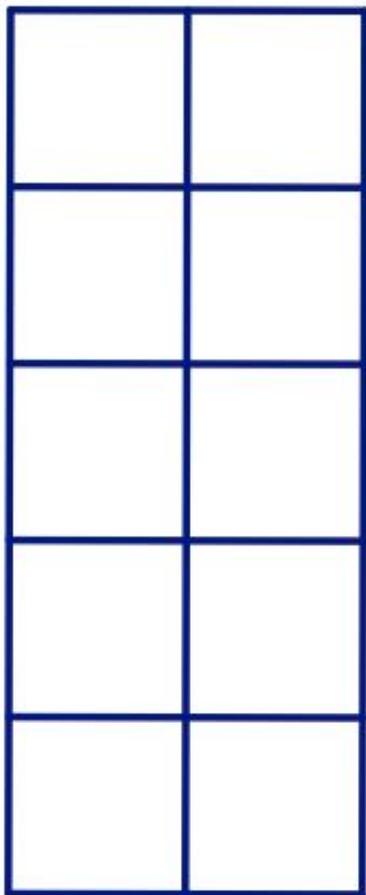
Where there any particular question types or turns of phrase the teachers used during the conversations?

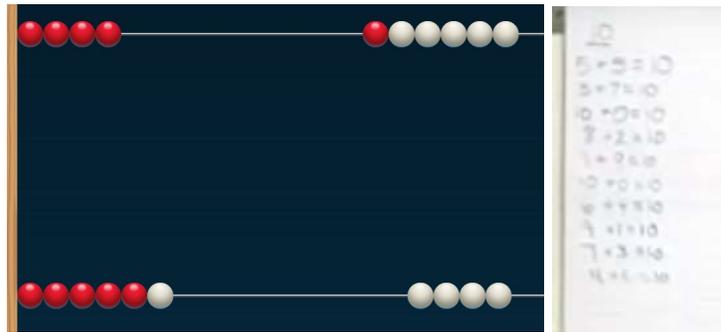# Practicing a Dot Pattern Talk with Double Ten-Frames - Gallery Walk

Grade K – Doubles
Grade 1 – Doubles and near doubles
Grade 2 – Adding 8 plus another number

Using a Rekenrek to Compose and Decompose Numbers: Guess My Way (Kristine - 1st grade)

Number Talk Routine for Guess My Way

1. Select a target number and represent using a hidden Rekenrek.
2. Children represent a guess of teacher's "way" on their own Rekenrek.
3. Selected child states guess (i.e. 3 on top and 7 on the bottom)
4. Teacher records strategy (e.g. 3+7 = 10)
5. "How do you know that makes 10?"
6. "That is a good way to make 10, but not my way."
7. Children may change your Rekenrek.
8. Repeat steps 2 to 6 until students figure out teacher's way then reveal.

Doing your own Number Talk using a Rekenrek

Target Number: _____

Beads on top: _____

Beads on the bottom: _____

What mental images do children need to have number sense involving whole numbers between 0 and 20?