Welcome to Erikson
Early Math iNNOVATIONS
Learning Lab 6!

erikson
early mathematics education

Content Focus

- October: *Numerosity & Number Sense*
- November: *Counting, Cardinality & Number Sense*
- January: *Number Composition*
- February: *Number Operations*
- March: *Grouping Situations*
- **Today: Using Number Sense & Algorithms to Solve Problems**

Strategy Focus

- October: *Turn & Talk*
- November & January: *Learners rephrase other learners' thinking*
- February: *Sharing multiple solutions or strategies without comment*
- March: *Teachers model students' thinking.*
- **Today: Students explain or model their own thinking.**

How do children solve problems?

- Direct modeling
- Counting (including skip-counting)
- Derived facts
- Paper & pencil procedures

Video Analysis

"Finding the Unknown" (a kindergartener)

(Erikson EME *Focus on the Child*)

- What strategies is Brendan using to solve the problem?
- What does Brendan seem to understand about the problem situation?

What is an algorithm?

Why is understanding how & why an algorithm works so important?

In this chart, “algorithms” refers to paper-and-pencil procedures that were directly taught by the teacher or parent.

Table 2.3: Answers to 7 + 52 + 186 Given by Three Classes of Second Graders in May 1990

Algorithms $n = 17$	Some algorithms taught at home $n = 19$	No algorithms $n = 20$
9308		
1000		
989		
986		
938	989	
906	938	
838	810	
295	356	617
		255
		246
245 (12%)	245 (26%)	245 (45%)
		243
		236
		235
200	213	138
198	213	—
30	199	—
29	133	—
29	125	—
—	114	
—	—	
	—	
	—	
	—	

Note: Dashes indicate that the child declined to try to work the problem.

Kamii, C. (2004). *Young Children Continue to Reinvent Arithmetic, 2nd Grade* (2nd ed). Teachers College Press.

Video Analysis

"2nd Grader working on 2-digit subtraction"

(University of Virginia)

- What strategies is this child using to solve the problem?
- What does this child seem to understand about the problem situation and how the strategies work?

How do we balance direct teaching of algorithms with encouraging children to invent their own?

How do we build on children's number sense to develop their understanding of why various algorithms work?

Lesson Analysis

"Fair Shares" (pre-K)

"Animal Weights" (1st)

- What can a teacher do in leading these lessons to support children showing/explaining their thinking?
- How can a teacher present suggestions while ensuring that children build understanding?

Video Analysis

"Multiple Strategies for 2-digit Subtraction"

(Lenses on Learning)

- What is the value of giving children chance to explain own thinking?
  - How does it help the teacher?
- What is value of diverse strategies *that come from the children*?
  - How does it help the teacher?

Focus Strategy:
Students explain or model their own thinking.

- Why is it effective?
- How does it develop children's thinking, problem solving & communication?
- How can you make it work for mathematics in your classroom?

Using good books to help students think mathematically

- Where's the math in the book?
  - What are the Big Ideas?
- How can you bring the math out of the book?
  - What kind of activities could you use to develop children's thinking about the math of the book?