Relational Thinking

Episode Number	Episode Description	Discussion Questions	My Ideas
2.1 Relational Thinking Learning To Think Relationally.	A second grader solves six open number sentences designed to encourage relational thinking. At the beginning of the session, she computes both sides of an equation to solve the number sentences. By the end of the interview, the child uses relational thinking to solve the number sentences. The child then realizes that she could have used relational thinking for all the number sentences. This episode is discussed in *Thinking Mathematically*, Chapter 3.	Decide why each number sentence posed might be particularly useful in developing relational thinking. If you were this child's teacher, what problems would you have her work on next?	
2.2 Using Relational Thinking to Solve Problems.	A second grader uses relational thinking to solve four problems. The problems progress in difficulty. This episode shows how a teacher might sequence problems to assess or stretch children's use of relational thinking. The child's strategy for the fourth problem is somewhat difficult to understand. (This child appears as a Kindergartener in episode 1.1)	Stop the video after the child has solved the first two problems. Show the third problem and ask people to predict what strategy he will use on the third problem. Is the strategy that this child used on the fourth problem a valid strategy? Could you use it to solve, $127+79 = 145+m$?	
2.3 Using Relationships to Generate Number Facts.	A third grader solves a series of number sentences designed to encourage her to think about multiplication in relationship to addition. The problems are tightly sequenced so that she can use what she learns on one problem to help her solve the next problem. (Episode 3.3 on CD)	The number sentences posed led to the number sentences $4 \times 7 = \square$. Design a similar sequence of number sentences to lead to the number sentence, $6 \times 8 = \square$. What implications might such series of number sentences have for learning multiplication and division facts?	

2.4 Sharing Strategies for 47 + 56 = 45 + 58.	A teacher poses this problem to five fourth graders. Three different strategies are shared. Children are very clear in explaining their strategies.	Describe each strategy. What strategy might each of these children use to decide whether 84 + 27 = 74 + 37 and 56 + 38 = 59 + 36 are true of false?	
2.5 Sharing Strategies for 94 + 68 = 95 + 64 + □.	A teacher poses this problem to five fourth graders. After two children share correct strategies for solving this problem, a third child shares an incorrect strategy. The children who have correct strategies explain a variety of strategies to help their classmate understand this problem. Eventually the third child explains a correct strategy. Several different correct relational thinking strategies are explained.	Explain the different correct strategies used to solve this problem. What questions does the teacher pose to ensure that the girl in the red shirt understands her final strategy?	
2.6 Sharing Strategies for Number Sentences.	A second-and third-grade class works individually to decide whether these number sentences are true or false: 3 x 7 = 7 + 7+ 7; 6 x 4 = 2 x 4 + 4 + 8; 10 + 10 = 3 x 9 + 3. Some children present their solutions to the class. Some of the strategies shared are concrete yet make use of mathematical relationships.	What are the mathematical relationships embedded in the strategies that the children present?	
2.7 Using Relational Thinking to Solve 9 x 6.	Children in a second-and third-grade class work individually to find different ways to figure 9 x 6. Two different relational thinking strategies are shared. One strategy makes use of fives and the other makes use of tens. The teacher asks a child other than the child who presented the strategy to write a	What strategies might these children use to figure 9 x 4? What number sentences correspond to these strategies?	

	number sentence to correspond with each strategy. $9 \times 6 = (9 \times 5) + (9 \times 1)$ and $9 \times 6 = 6 \times 10 - 6$ are the number sentences the children write.		
2.8 Sharing Strategies for Number Sentences	A third-and fourth-grade class discuss solutions for these problems: $8 \times 9 = 8 \times 10 - p$ and $67 \times 9 = 67 \times 10 - r$. For the first problem, three strategies are shared: one child computes, one child uses incorrect relational thinking and one child uses relational thinking. Children, rather than the teacher, discuss the incorrect strategy and why it doesn't work. A child solves the second problem by relating it to the first. (The last child to share his thinking is also shown in episode 4.2)	What does each child who shares understand about multiplication? Why pose these types of number sentences to children? Why is focus on relationships important?	
2.9 Using the Distributive Property to Solve Number Sentences.	A third grader uses the distributive property to solve a series of math problems. The problems progress in difficulty. This episode shows how a teacher might sequence problems to assess or stretch children's use of the distributive property. The child's justifications of why his strategies work are firmly grounded in his understanding of multiplication as grouping.	Stop the videotape after the child solves the first 2 problems. Ask, what problem might you pose next to this child? What benefits were there to using such large numbers in these problems?	