Mini-Lesson Introducing Cuisenaire Rods Using Additive Reasoning

Learning Goals	Apply properties of operations and place value to add whole numbers.* To understand this at the Communication/Applications level (level 4) where: ● Students can add whole numbers accurately and with understanding using the standard algorithm. ● Students have a deep understanding of addition and can explain why the standard algorithm works using multiple representations (including concrete materials, pictorial symbolic models) as opposed to simply memorizing a process. ● Students can use the properties of operations to generate equivalent numerical expressions and can explain and demonstrate how the properties of operations and place value make the standard algorithms possible. ● Students are able to apply addition to multiple contexts - both in mathematics and the real world - and can contextualize and decontextualize problems involving all multiplication on whole numbers. *This is a second grade non-negotiable, but must be revisited if students do not understand the area of a rectangle model because it is needed for multiplication and division of decimals, fractions and polynomials.
Prerequisites *(Pretest these to identify needs for intervention)*	● Number concept
Common Misconceptions	Confusing area and length.
Tool Building Menu	Possible Visual Cluster Card activities: ● Identifying the number ● Two more than the number ● Making 10 ● Adding 9 ● Doubles ● Or students make up their own rule

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	Focus on finding answers quickly with NO counting. If a student is hung up (hesitates for more than 2 seconds), ask him or her questions like: ● If the card has 9, **say:** "Do you see five there?" Cover the five. "Now how many do you see?" (4) "What would 5 and 5 be?" (10) "So, what would 5 and 4 be?"
Intuitive Hook	1. Have students "Make the staircase" several times. If students do this quickly, ask individuals to challenge themselves by building it with their eyes shut. 2. **Say:** "Show me the white rod. " Students hold up the white cube. 3. **Say:** "What shape is this?" (A cube) "How do you know it's a cube?" (Students will give responses like a "square," if so draw a square and point out that a square is 2-dimensional) 4. **Say:** "Put your finger on a vertex (a corner). How many lines are emanating from that point? (Three) Can you run your finger along them? Are they all equal in length? That's how we know it's a cube. 5. **Say:** Touch the length that defines this cube. I am going to define this length as 1. This is one unit cube. We'll call it one because the length is one."
Language Building *(Done during Concept Building)*	● length (edge) ● face (area) ● vertex (point) ● Horizontal v. vertical ● Parallel ● Sum ● Addend ● Commutative Property of Addition ● Associative Property of Addition
Concept Building	1. **Say:** "Show me a 2" (If students pick up two ones instead of the red, ask "Can you do it more efficiently? With fewer rods?" 2. **Say:** "Prove it's has a length of two." (Students should get out two ones) "Line them up horizontal and parallel. This is how we make an equation."

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	3. Do: Have a student share on the overhead and/or draw a sketch on the board. Say: "Let's record this as a math equation. What kind of problem is this?" (Addition) "What's the equation?" (1+1=2) "1 and 1 are the addends and 2 is the sum." 4. Do: Have students put the rods back in the box. **Say:** "Show me 8." (Students hold up the 8) "Prove it's 8 using twos." 5. **Say:** "If there another way to make a length of 8. Find all of the ways to make 8." **Do:** Look for students to be systematic about this task. Have the 8 at the top, beneath that the 1 and 7, then 2 and 6, etc. If students stop at 4 and 4, encourage them to keep going until they get all 10 of them. 6. Do: Have a student share out their combinations. Make sure they are lined up precisely and are set up perfectly parallel. Say: "Let's read these as addition problems from left to right. We'll touch them as we say them." Read: ● "Zero plus 8 is 8, 8 equals 0 plus 8" ● "1 plus 7 is 8, 8 equals 1 plus 7 " ● "2 plus 6 is 8, 8 equals 2 plus 6" ● "3 plus 5 is 8, 8 equals 3 plus 5" ● "4 plus 4 is 8, 8 equals 4 plus 4" ● "5 plus 3 is 8, 8 equals 5 plus 3" ● "6 plus 2 is 8, 8 equals 6 plus 2" ● "7 plus 1 is 8, 8 equals 7 plus 1" ● "8 plus 0 is 8, 8 equals 8 plus 0" 7. If you are doing an additive reasoning intervention (for students who don't have their addition sight facts down), record the equations in their notes and do the same exercise with whole numbers from 5 to 10. FOR THE MINI-LESSON BEFORE MULTIPLICATIVE REASONING SKIP THIS. 8. Say: "Put everything away but the 1 plus 7 and the 7 plus 1. Line them up horizontally and parallel to one another. Let's read this as an equation." (1 + 7 = 7 + 1) What property is this? This is the Commutative Property of Addition. Show me the commutative property of addition using 3 and 5." 9. Say: "Show me 14" (Student should have a ten (orange) on the left and a 4 (purple) on the right. If students come up anything else ask them "Can you do it more efficiently? Can you build it the way we write it." STOP HERE IF ALL YOU WANT IS THE MINI-LESSON BEFORE MULTIPLICATIVE REASONING.

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	Modeling carrying in multi-digit addition will follow.
Practice	
Formative Assessment	