Lesson #3: Using Whole Number Rods to Compare Two-Digit Numbers (Operations) – A Focus on Spatial Reasoning	**Grades 2&3**

M/O: 15 mins Action: 20 mins C&D: 25 mins	**Math Learning Goal:** - Numbers can be composed and decomposed in a variety of ways. Two-digit numbers can be composed into tens and ones. - Numbers can be compared using addition or subtraction; both involve composing and decomposing of numbers **Mathematical Process Focus:** Selecting tools & computational strategies Students will use relational rods to develop understanding of the composition and decomposition of number using spatial reasoning	**Materials** - relational rods (whole number focus) - post-it notes or strips of paper - markers - observation template

Specific Expectations:
Grade 2:
– represent, compare, and order whole numbers to 100, including money amounts to 100¢, using a variety of tools
– compose and decompose two-digit numbers in a variety of ways, using concrete materials
– solve problems involving the addition and subtraction of two-digit numbers, with and without regrouping, using concrete materials, student-generated algorithms, and standard algorithms;
Grade 3:
– solve problems involving the addition and subtraction of two-digit numbers, using a variety of mental strategies (e.g., to add 37 + 26, add the tens, add the ones, then combine the tens and ones, like this: 30 + 20 = 50, 7 + 6 = 13, 50 + 13 = 63);

Assessment (A) and DI (D) Opportunities

Minds On… **15 mins**	**Pairs → Visualize-Pair-Share** (15 mins) Start by showing students one unit. (Students may wish to hold the unit in their hands.) *Close your eyes. Visualize a line of rods that is 28 units long. If you use the whole number rods, which rods would you use to show a length of 28 units?* **Whole Group → Share** Have students describe / show their representation using the mathies relational rods. Pair a number sentence that matches the representation. Emphasize the composition of the number that includes tens and ones. *Why is it a good idea to represent 28 units using these rods? (e.g. tens are easier to count / group; it is easy to see relationship of ones as compared to 10, e.g. 10 – 2 = 8)* Use the same rod 'strategy' to represent the number 57.	**SR** Encourage visualization strategies Support connections between concrete/visual and numeric representations by pairing a number sentence (10 + 10 + 8 = 28) with labelled whole number rods. **SR** Provide meaningful opportunities to investigate mathematical concepts and problems by using manipulatives.
Action! **20 mins**	**Pairs → Compare** (20 mins) *57 is greater than 36. How much greater is 57 than 36? Use the rods to show your math thinking. Write a number sentence on a post-it note that matches your actions with the rods.* **Whole Group → Share** (10 mins) Invite students to come to the interactive whiteboard to share models. Record number sentences that reflect the whole number relational rod models with corresponding gestures and actions with tools. Name the math thinking that reflects the comparison using the rods (e.g. adding up, counting backwards, comparison). Draw students' attention to the relationships across models. *What number sentence matches the actions with rods?* *What is the same / different about these rod models? How does <this> part of <this> number sentence match <this> part of <this> number sentence?*	www.mathies.ca **SR** Take advantage of technology **A for L** Observe students as they create each number, and how they compare the two numbers. Are they leveraging 10-rods to represent each number? Pay attention to students' gestures and mathematical actions with the tools (e.g. combining, missing addend, difference.). Draw attention to these during whole group share.
Consolidate / Debrief **25 mins**	**Whole Group → Share** What did we learn today about comparing two-digit numbers using whole number rods?	**SR** Use gestures and encourage students to use gestures [and/or mathematical actions with tools]
Home Activity / Further Classroom Consolidation *Concept Practice*	**Home Activity or Further Classroom Consolidation** Choose 2 two-digit numbers. Which number is greater and by how much? Use the whole number rods to show your thinking. Write a number sentence that matches your math thinking strategy.	