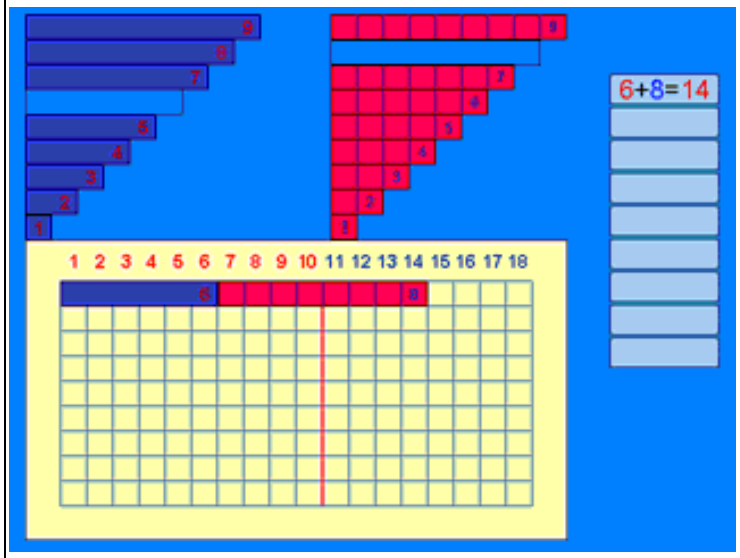
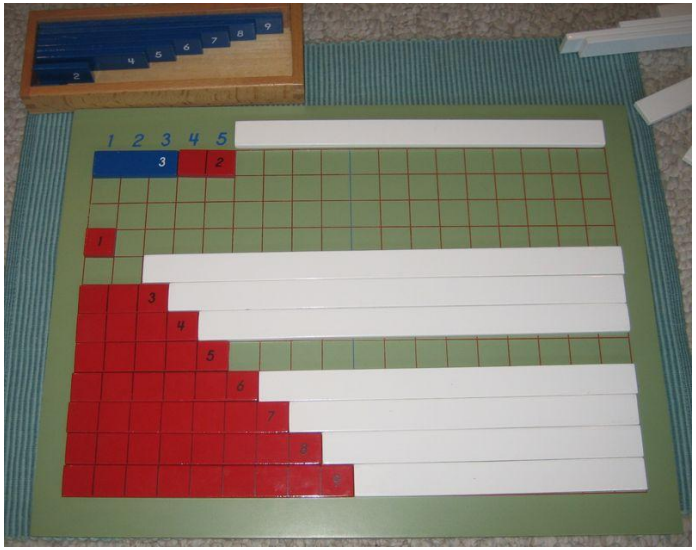
Grade Level	Content Area	Course Title *(9-12 Samples Only)*	Unit Title
Kindergarten	**Math**	**N/A**	Investigating Sums and Differences
Length of Unit	**Time of Year Taught**	**Expected Prior Knowledge**	
6 – 8 weeks	Late winter/spring	Understanding numbers and quantities 1-10; experience with addition and subtraction including beginning lessons with the Montessori strip boards	
Unit Description			
By constructing models with the Montessori addition and subtraction strip boards, students will investigate sums and differences from 1 through 10.			
Strand(s), Concept(s), and PO(s)	**M01-S3-C3-PO1** **Strand 3:** Patterns, Algebra & Functions **Concept 3:** Algebraic Representations Represent and analyze mathematical situations and structures using algebraic representations. **PO 1.** Record equivalent forms of whole numbers to 100 by constructing models and using numbers.		
Summative Assessment	When given a quantity (e.g. 9), the student will set up the Montessori addition strip board to find quantities that equal the sum (e.g. 9) and record the equations (e.g. 9 = 4 + 5). Then he/she will set up a difference (e.g. 9) on the Montessori strip board, find, and record equations that equal the difference (e.g. 9 = 10 – 1)		
Assessment Scoring	Assessments will be scored with the attached rubric. A score of 4 represents “exceeding,” 3 “meeting,” 2 “needs additional work,” 1 “needs much additional work.”		

Materials/Resources Needed	• Montessori addition strip board: a board with columns and rows of squares and a box of strips. The numeral 1 through 18 are printed across the top of the board. The box contains two sets of strips 1 through 9 – a blue set with a numeral 1-9 printed on each and a red set divided into 1-9 squares with the appropriate numeral printed. Both sets represent addends. • Numeral cards: 1=10 • Pencil • Paper • Montessori subtraction strip board: a similar board and box of strips. The blue strips represent the subtrahend while the divided red strips represent the difference or remainder. This material also includes a box of white strips 1 through 18 squares in length.  **Montessori Addition Strip Board**  **Montessori Subtraction Strip Board**

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Lesson Instruction	Investigating a Sum Since the student has work with the Montessori addition strip board previously, he will set it up with the strips next to the board - the solid blue strips to his left and the divided red strips to his right. He will choose a numeral card (e.g. 6) denoting the sum to be investigated. Have the student place the blue 1 strip on the board. Have the student notes the number of squares needed to make the sum and place the red strip next to the blue (e.g. 5 squares are needed so the red strip with five sections is placed next to the blue strip). The student places the blue 2 strip on the board and the corresponding red strip below the first set to make the same sum. The student continues until he has placed the red 1 strip. The student is shown how to record the equations (e.g. 6=1+5, 6=2+4, 6=3+3, 6=4+2, and 6=5+1). Other examples are done to ensure that the student knows the process.	Sums with Zero as an Addend The student sets up the strip board as before and chooses a sum to investigate (e.g. 4). Have him to put no blue strip on the board. Which red strip will he need ? The red strip that represents the sum (e.g. the divided red 4 strip). Continue as in lesson 1. After placing the red 1 strip, have the student check if another strip could be placed – the blue strip that represents the sum (e.g. the blue 4 strip). The student is shown how to record the equations (e.g. 4=0+4, 4=1+3, 4=2+2, 4=3+1, and 4=4+0). Other examples are done to ensure that the student knows the process.	Investigating a Minuend Since the student has work with the Montessori subtraction strip board previously, he will set it up with the strips next to the board - the solid blue strips to his right and the divided red strips to his left. He will choose a numeral card (e.g. 10) denoting the minuend to be investigated. A wooden strip is placed on the board covering all the numbers after the chosen minuend (e.g. 10). Show the student to place the blue 1 strip next to the wooden strip to subtract 1. The answer is the last number uncovered. Show how to write the equation. (e.g. the number 9 is left. The equation is 10-1=9). Replace the blue 1 strip with the blue 2 strip. Note the answer and record the equation. (e.g. 10-2=8). Continue replacing the strips until the zero is reached or the blue 9 strip is used. Record each equation. Other examples are done to ensure that the student knows the process.	Investigating the Difference The student sets up the subtraction strip board as before. He will choose a numeral card denoting a difference to be investigated (e.g. 5). The red divided strip representing the chosen difference is placed in the top row of squares (e.g. the red 5 strip is placed). The blue 1 strip is placed next to the red strip and the number directly above the end of the blue strip is noted. This is the minuend while the blue strip is the subtrahend. Show how to write the equation (e.g. 6 appears directly above the blue 1 strip, so 5=6-1). Replace the blue 1 strip with the blue 2 strip. Note the minuend and record the equation (e.g. 5=7-2). Continue until the minuend of 10 is reached (e.g. the equations would be 5=6-1, 5=7-2, 5=8-3, 5=9-4, and 5=10-5). Other examples are done to ensure that the student knows the process.	Differences with Zero The student sets up the strip board as before and chooses a difference to investigate (e.g. 4). Have him place the red strip as in lesson 4. This time have him to put no blue strip on the board. The minuend is the same as the remainder. What was subtracted – zero. Show how to write the equation (e.g. 4-0=4). Continue as in lesson 4.

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Student Activities	The student chooses a numeral card for the sum he is investigating. He places the strips as in lesson 1 and records the equations.	The student chooses a numeral card for the sum he is investigating. He places the strips as in lesson 2 and records the equations, being sure to include zero.	The student chooses a numeral card for the minuend he is investigating. He places the strips as in lesson 3 and records the equations.	The student chooses a numeral card for the difference he is investigating. He places the strips as in lesson 4 and records the equations.	The student chooses a numeral card for the difference he is investigating. He places the strips as in lesson 5 and records the equations, being sure to include zero.

Summative Assessment

Student will demonstrate various ways to construct any quantity from 0-10 given by teacher using both the addition and subtraction strip board.
Students will be scored on the accuracy of the constructed models to show the quantity given by teacher.
Students will be given points for demonstrating accuracy based on the following scoring: 3 POINTS OR MORE IS CONSIDERED MASTERY
4 points if both the addition and subtraction strip boards are set up as follows:
9/10 addition equations are correct
9/10 subtraction equations are correct
3 points if both the addition and subtraction strip boards are set up as follows:
Both addition and subtraction strip boards are correct but may be in a random order.
8/10 addition equations are correct.
8/10 subtraction equations are correct.
2 points if boards are set up as follows: STUDENT IS IN NEED OF ADDITIONAL PRACTICE, AND MAY REQUIRE TEACHER ASSISTANCE OR PEER TEACHING.
One strip board is set up correctly, while the other is not.
6/10 addition equations are correct.
6/10 subtraction equations are correct.
1 point is given as follows. THIS STUDENT REQUIRES INTERVENTION BY TEACHER DIRECTLY WITH ADDITIONAL LESSON, OR PREVIOUS LESSON IN SEQUENCE.
Neither strip board is correct.
Less than 6/10 addition equations are correct.
Less than 6/10 subtraction equations are correct.

Score: _____
16

Student _____

Assessor _____

Date _____

Assessment Rubric
Kindergarten Mathematics
Investigating Sums and Differences with the Montessori Addition and Subtraction Strip Boards

	Exceeding (4 points)	**Meeting (3 points)**	**Needing Additional Practice (2 points)**	**Needing Intervention (1 point)**	**Score**
Addition Board	Completely correct	Correct, but in a random order	One strip board is set up correctly, while the other is not	Not correct	
Subtraction Board	Completely correct	Correct, but in a random order		Not Correct	
Addition Equations	9/10 correct or better	8/10 correct or better	6/10 correct or better	Less than 6/10 correct	
Subtraction Equations	9/10 correct or better	8/10 correct or better	6/10 correct or better	Less than 6/10 correct	

Grading Scale:

Classification	**Points**
Exceeding	15 - 16
Meeting	13 - 14
Needing Additional Practice	11 - 12
Needing Intervention	10 and lower