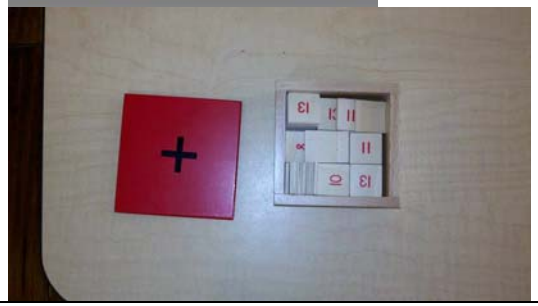
Grade Level	2	**Content Area**	**Mathematics (K-8)**
Course Title (grades 9-12 Only)			
Length of Unit	Each presentation is 15 to 30 minutes.	**Time of Year**	Spring
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Sample: Ten's and units (ones) place value Addition & subtraction within ten's place—static to dynamic Extensive memorization work in addition and subtraction		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	This section of mathematical principals begins with the addition and subtraction memorization boards. This process while starting with the single digits is used with the small bead frame (similar to an abacus) allows the child to move into the larger place values. Montessori has a particular strength in its method to not only reinforce concepts by repetition but also by changing the lesson to see the same principle from a different angle. In this way the student remains engaged with the material and the work. This changing the work or material also gives the student a broader and deeper understanding of the concept at hand. For the below concept the student is presented with a number of different charts all leading to the same concept. In addition to keeping the student interested in the activity the teacher is given ample opportunity to view the mastery of the concept. Any inaccuracies in the student's work quickly become evident. The small bead frame allows the student to manage the concepts of large numbers without becoming overwhelmed. The simplicity of the material allows for quick calculations while maintaining the hand brain connection so important in Montessori. The physical representation of the small bead frame matched with the fluid memorization of the charts allows the student to gain mastery of place value, properties of operation, and composition and decomposition.		
Standard Number and Description *List the Number* and full description for the required Standard.*	Grade: 2 2.NBT.5 Domain: Numbers and Operations in Base Ten (NBT) Cluster: Use place value understanding and properties of operations to add and subtract. Standard: #5 - Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.		
Summative Assessment *Describe a cumulative and comprehensive activity, clearly separate from instruction and guided or independent practice, which allows each student to individually demonstrate mastery of the required Standard. A copy of the summative assessment must be attached to the curriculum sample.*	Student's work—constructed tables w/verbal assessment Completed blank chart at 80% accuracy Demonstrates Addition strategies based on place value - adding by place value - Incremental adding - Compensation Subtraction strategies based on place value - Adding up (from smaller number to larger number) - Incremental subtracting - Subtracting by place value Properties that students should know and use - Cumulative property addition		

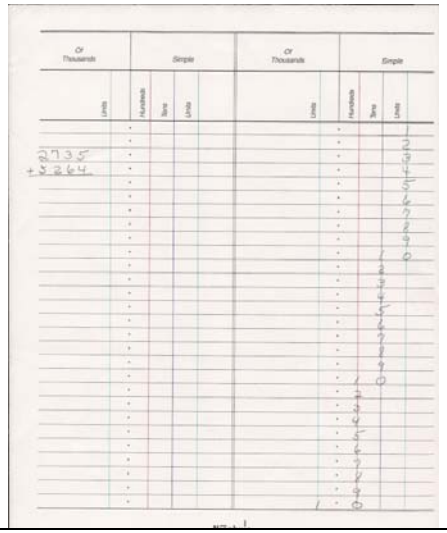
	- Associative property of addition - Identity property of 0 Ability to communicate understanding of properties and which ones to use for certain operations
Scoring Scale and Mastery Level *Explain how the assessment is scored, to include points per question, how points are awarded, total points possible, criteria necessary to demonstrate mastery, and grading scale. A copy of the answer key and scoring rubric (whichever applicable*	The student must achieve an 80% rate of success on the blank board, the written problems, and the verbal assessment using the attached rubric for scoring.
Materials/Resources Needed	Montessori Materials: Addition & Subtraction Memorization Boards. A red rimmed basket, with folded slips of paper for all the addition problems of Full Chart written without answers. Half Chart, Skip Chart, and Blank Chart, and the Check Chart. Wooden box with lid containing wooden tiles labeled with printed numbers (used for answers). Small bead frame, special sheet for small bead frame, work sheets with different problems as described in student activities. Other Materials: Pencil, pencil holder, and paper

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	**Instruction**	**Student Activities**
1	During the first lesson the teacher walks with the child to bring the materials (starting with the Full Chart) to the table. The teacher sits next to the child and introduces all aspects of the Full Chart. The aspects of the Full chart are the blue upper horizontal section numbered 0-9, the vertical red section numbered 1 through 9, the remaining 81 squares containing every possible answer. The teacher then introduces 10 printed problems, placing them in a row to the right of the chart. The teacher points to the first printed problem and asks the student " Can you please read this problem?" Example 4 + 6 =. After the student has responded the teacher asks "Remember the first addend is always blue so I will put my finger on the blue 4." "The second addend is 6, so I will put my second finger on the red 6." "Now, I will slid my top blue edge finger down, and then slide my red edge finger across until they met." "They met on the 10." "4 + 6 = 10." " I will write that down." Write in full view of the child 4 + 6 = 10. Now the teacher turns the problem face side down and demonstrates several more problems. Each time the teacher Identifies addends, slides the blue and red fingers across	The child completes a sheet of 30 addition simple single digit problems. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.

	until they intersect, announces the answer, writes the problem down and turns the problem over. The teacher then invites the child to try. Once the child has completed 10 problems the teacher shows the child where the Check chart is located in the classroom. The child then places the Check Chart next to their work and the teacher shows the child how to check their work.	
2	During the second lesson the teacher walks with the child to bring the materials (Half Chart) to the table. The teacher sits next the child and introduces all aspects of the Half Chart. The aspects of the Half Chart are that it is half of the previous chart, the red edge starting at number 1 down through 9, and the white answer squares appearing as somewhat of a stair step arrangement. Again have printed problems, paper and pencil. The teacher says “This is called the Half Chart.” “It is one half of the Full Chart.” “Will you please read the first problem?” Example 4 + 6 =. “I will put my first finger on the red 4.” “Now I will put my second finger on the red 6.” “I will slide my first finger to the end of its row, row 4.” “Now I will slide my second finger on number 6 across to meet it.” “Look they met at 10, 4 + 6 = 10.” “I will write this problem down.” Then turn the printed problem face down. The teacher demonstrates several more problems and then invites the child to try. Once the child has completed 10 problems show the child how to check their work using the Check Chart.”	The child completes a sheet of 30 addition simple single digit problems. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.
3	During the third lesson the teacher walks with the child to bring the materials (Skip Chart) to the table. The teacher sits next the child and introduces all aspects of the Skip Chart. Again have printed problems, paper and pencil. The teacher says “This is called the Skip Chart.” “Will you please read the first problem.” Example 3 + 6 =. “I will put my first finger on 3.” “Now I will put my second finger on the 6.” “This time I will slide both of my fingers one at a time across to the end of their rows.” “Look these rows do not meet.” “They do not intersect.” “I must move my fingers towards one another to me. I will skip them.” Then the teacher moves their top finger and bottom finger each a square closer. They still will not meet, so they each move back one square to meet at the in between square of 9. “3 + 6 = 9.”“I will write this problem down.” Then turn the printed problem face down. The teacher demonstrates several more problems and then invites the child to try. Once the child has completed 10 problems show the child how to check their work using the Check Chart.”	The child completes a sheet 30 of addition simple single digit problems. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.
4	During the fourth lesson the teacher walks with the child to bring the materials (Blind Chart) to the table. The teacher sits next the child and	The child completes a sheet of 30 addition simple single digit problems. The problem sheet should be completed with no error

	introduces all aspects of the Blind Chart. The Blind Chart does not have any answers. Introduce the answer tiles. Take them out of the box and put them in order with the child. The top row will number left to right 2 – 18, with row two being 3 – 17 they continue in this way forming an inverted triangle with the very last row being only the number 10. Again have printed problems, paper and pencil. The teacher says “This is called the Blind Chart.” “Will you please read the first problem.” Example 4 + 6 =. .” Example 4 + 6 =. “I will put my first finger on the red 4.” “Now I will put my second finger on the red 6.” “I will slide my first finger to the end of its row, row 4.” “Now I will slide my second finger on number 6 across to meet it.” Choose the answer tile, 10 and place it in this square. The child should know the essential addition combinations by now, and this is a fun reinforcing activity. “I will write this problem down.” Then turn the printed problem face down. The teacher demonstrates several more problems and then invites the child to try. Once the child has completed 10 problems show the child how to check their work using the Check Chart.”	before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet. 
5	The fifth lesson the teacher walks with the child to bring the materials (Full Chart) to a table. The teacher sits next to the child. The teacher says “Open the problem basket and line up 10 problems.” The teacher has paper and pencil ready to write problem. “Can you read the first problem?” Example “Yes, 7 take away 3” “The take away number is always found on the blue row.” “The minus sign will help remind you.” The teacher works the first problem. The teacher puts one finger on the red 7 square, and one on the blue – 3 square. The teacher moves one finger at a time. Sliding down from the red square and sliding over to meet along the blue square’s row. “Our answer is 4.” “I will write our problem and answer.” The teacher writes out 7 – 3 = 4, for the child to see. “Can you do the next problem?” Allow the child to continue to work the problems and write the problems with answers. The teacher then shows the student how to check their work using the Check Chart.	The child completes a sheet of 30 subtraction simple single digit problems. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.
6	During the sixth lesson the teacher and student set the work up on a table. The teacher introduces the tiles and reminds the student that they used the same tiles in the addition Blind Chart. Both the student and the teacher arrange the tiles above the Blind Chart. The teacher asks the student to get 10 problems and place them on the table. The teacher then says “We do not need to use a pencil and paper today we will use the tiles for our answer.” “Can you read the first problem?” Example, “Yes, 7 – 6 =.” The teacher asks, “What is 7 – 6?” as you slide your finger down from the red 7 and across from the blue 6 to a blind square. The child should know his	The child completes a sheet of 30 subtraction simple single digit problems. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.

	essential subtraction combinations and answer, “1”. “Please place a ‘1’ tile in this answer square.” “Can you do the next problem?” Allow the child to continue to work his problems, placing his answer tiles in the correct blind square. The teacher then shows the child how to check the problems using the Check Chart.	
7	The seventh lesson begins with the teacher and the student bringing the small bead frame to the work table. The teacher says “This is the small bead frame.” The teacher then introduces all the aspects of the small bead frame, including the white and gray category markings on the left. Then the teacher slides all the beads to the right side of the frame, and begins to count the beads on the top wire aloud with or without the child. As the teacher slides the 10th unit bead to the left they say “ Ten units exchange for one 10” and immediately slide the 1st 10 unit bead to the left side and slide the 10 units back to the right side of the frame. The teacher repeats this counting, exchanging, sliding for the bead frame into the 100’s place value. Then the teacher introduces the special small bead frame notation paper, including the headings, vertical lines under each heading, the left and right sides. The teacher demonstrates to the child’s understanding the proper way you write your numbers, using correct vertical lines, and having that line bisect the number. The teacher then fills out the sheet and announces that they will build some sums. The teacher then writes a large number. Starting with the units, the teacher builds the number with the beads of each category. The teacher demonstrates to the child that the number is built from units to hundreds, however, the number is read from thousands to units.	The child fills out an entire sheet using the small bead frame to compose the numbers on the sheet. See attached. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet. 
8	Once the child has filled out an entire sheet and announced the numbers correctly the teacher says “We are going to do something different.” The teacher then writes an addition problem on the left side of the notation paper. “Let’s make the first addend on the frame.” The teacher then makes the correct number on the frame. Then the teacher says “Let’s put the second number on the frame.” The teacher then slides the second number onto the first addend on the right side of the frame. The teacher then says “What is our answer?” The child reads the answer and the teacher records the answer on the sheet.	The student records 20 static addition problems in the 100’s place value on their own. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.
9	Once the child has become comfortable with the above concepts as evident is their work without error the teacher presents the concept of dynamic addition. This begins with the child building the first added. Then the child builds the second addend but this time the number of the first plus the second is larger than the number of beads on the unit wire. The teacher then	The student records 20 dynamic addition problems in the 100’s place value on their own. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.

	demonstrates the following steps: - Count out the unit beads, “1, 2, 3, 5, 6” (you are out of beads) - Immediately, while repeating “6” aloud, slide one ten bead to the left - Next begin counting the units beads still needed, “7, 8, 9.” This is demonstrated slowly and carefully to the child. The teacher stays with the child until they are comfortable with this exchanging counting practice.	
10	Once the child has become comfortable with the above concepts as evident in their error free work in the student activities section for lesson 9 the teacher introduces static subtraction. The teacher writes a simple static subtraction problem on the sheet and has the student build the first minuend on the sheet. Next the teacher refers to the problem (i.e. 472 – 431) and says, “Now we must take away.” Starting with the units the teacher says “We have two units, we need to take away one.” The teacher then slides one of the unit beads to the right side of the frame and asks “What do we have left?” “One unit” and the teacher writes down in the single place column under the 2 and 1. Next the teacher says “ We have 7 tens and must take away 3” Again the teacher slides the 3 take away ten beads to the right and asks the student for the answer. The child replies 4, now write the answer in the tens column. The teacher continues, writing 0 for the hundreds column. The teacher proceeds to let the child practice this in front of the teacher until the teacher can see the student is ready to try it on their own.	The student records 20 static subtraction problems in the 100’s place value on their own. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.
11	Once the lesson 10 has been mastered the teacher introduces the static subtraction. The teacher writes the problem out. 542 – 485. The child starts to build the minuend of 542 on the frame. The teacher starts the take aways, “From 2 units can we take away 5?” “No” “ We need to borrow” The teacher slides 1 ten bead to the left, and then slides the 2 unit beads to the right as they say “2”, and then continues to count the number, “3, 4, 5.”This process is followed in the tens column. The teacher then asks the child to complete several problems in front of them. When the student is ready to work on their own the teacher gives them a sheet of dynamic subtraction problems.	The student records 20 dynamic subtraction problems in the 100’s place value on their own. The problem sheet should be completed with no error before continuing on to the next lesson. If errors are present review with the student and have the student complete another sheet.

Paste Summative Assessment Here:

Student’s work—constructed tables w/verbal assessment
Completed blank chart at 80% accuracy
Completed worksheets at 80% accuracy
Demonstrates
Addition strategies based on place value
- adding by place value

- Incremental adding
- Compensation

Subtraction strategies based on place value
- Adding up (from smaller number to larger number)
- Incremental subtracting
- Subtracting by place value

Properties that students should know and use
- Cumulative property addition
- Associative property of addition
- Identity property of 0

Ability to communicate understanding of properties and which ones to use for certain operations

Paste Answer Key/Scoring Rubric Here:

2nd Grade Math Assessment Rubric SAMPLE

Student:	Date:		
Text Structure: Use place value understanding and properties of operations to add and subtract.			
Standard/Objective: *#5 - Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.*			
Criteria for Mastery: 24 out of 30 points	1 = Approaching—needs more practice	2 = Meets standard	3 = Exceeds standard
Demonstrates Adding by place value	Demonstrates little or no understanding of concept.	Has one or two errors.	No errors. Performed perfectly.
Demonstrates Incremental adding	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Demonstrates compensation	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Demonstrates adding up	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Demonstrates incremental subtracting	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.

Demonstrates subtracting by place value	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Demonstrates cumulative property addition	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Demonstrates associative property of addition	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Is able to identify the property of zero	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
Able to communicate understanding of properties and which ones to use for certain operations	Demonstrates little or no understanding of concept	Has one or two errors.	No errors. Performed perfectly.
		TOTAL POINTS	
OBSERVATION NOTES:			