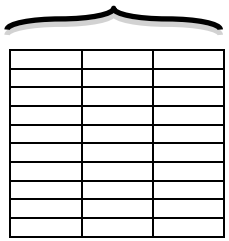
Grade Level	**3rd Grade**	**Content Area**	**Math**
Course Title (grades 9-12 Only)			
Length of Unit	**5 days**	**Time of Year**	**2nd Quarter**
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students should be able to fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction (3.NBT.2).		
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.*	The following methods of instruction are aligned to the Program of Instruction: (1) Common Core State Standard: instruction aligned to K.NBT.1. (2) Direct Instruction: teacher-led and driven instruction. (3) Instruction in Small Class Size: 30-2 student-teacher ratio. (4) Understanding by Design (UbD): UbD lesson plan template used; title/objective identified for every lesson. (5) RTI & Differentiated Instruction: RTI tier-2 and 3 students identified with DOMA screenings and/or formative assessments. Tier-2 and 3 students provided with differentiated instruction respectively in small group or one-on-one using the intrinsic RTI remedial properties of Singapore Math; that is: (a) Scaffolding: concrete-to-pictorial-to-abstract approach, math problems go from 1 step to 2 steps to multistep; (b) Visual representation: use of the bar modeling method; (c) Differentiation resources: modeling of proficient problem solving, reteaching opportunities, extra-practice, tips for helping struggling students, modeling with thinkalouds, corrective feedback and frequent cumulative review.		
Standard Number and Description *List the Number* and full description for the required Standard.*	**3.NBT.3** Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.		
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.*	Students will demonstrate their ability to multiply one-digit whole numbers by multiples of 10 in the range 10-90 using an algorithm and arrays. The assessment includes a total of 10 questions.		
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) must be attached to the curriculum sample.*	Students earn 1 point for each question. The assessment is worth a total of 10 points. At an 80% mastery level, students need to score 8/10 points to be considered to have mastered the assessed performance objective.		

Materials/Resources Needed	Teacher white board, student white boards, white board markers, place value sticks, rubber bands, graph paper, 9-sided dice, game cards. Singapore Math instructional materials.

Lesson (add as needed)	Instruction	Student Activities
	Objective: Students will use multiplication as a more efficient way of adding numbers repeatedly. Students will write a multiplication problem associated with an array, and create an array to represent an equation. Ask students to count by 20s to 100. Ask students to count by 10s to 200. Tell students that counting by 1s, 5s, 10s, and so on, is a skill they have mastered. Explain that now; they will learn some problem solving skills more efficient than counting or repeated addition. Tell students that specifically, they will learn how to multiply multiples of ten such as 10, 20, 30, 40, etc. **Guided Practice**: Write 10 x 5 on the white board. Tell students to use their place value sticks (each representing 10) to show what this problem looks like. Ask students how many sticks they used. Write this number (5), and label it "number of groups." Ask students how many ones are in each group, or what value each stick represents. Write this number (10), and label it "number in each group." Ask students to find the value of the sticks altogether. Give students an opportunity to share their answer and discuss their strategy for solving this problem within their base groups. Call on students to share with the class. Write a multiplication sign (x) between the 5 and the 10, and add = 50 on the white board. Explain to students that when we are counting by a certain number, we are adding that number repeatedly. A more efficient way of representing this calculation is by multiplying. Remind students that we are multiplying the number of groups by ten. Repeat this process for 9 x 10. Tell students that instead of solving for multiples of 10, we will now practice solving multiples of 20, 30, 40, and so on, to 90. Ask students to count by 20 to 200. Explain that we can find these multiples of 20 more	Students will count by 20s to 100, and 30s to 200. Students will display 5 sticks. Students will respond, 5 sticks. Students will respond, 10 ones. Students will count by tens to fifty. Students will use place value sticks to find the product. Students will count by 20 to 200. Students will display 6 bundles of 20 and determine the total number. Students will use place value sticks to represent the multiplication of a multiple of 10 by a whole number. Students will use place value sticks, bundled if necessary, to find the product of a whole number multiplied by a multiple of 10. Students will notice patterns in their products table.

1	efficiently by multiplying. Invite students to bundle their sticks into groups of 2. Ask students to show 20 x 6 using their bundles, and find the product. Students will share their findings, and the teacher will write 20 x 6 = 120 on the white board. Repeat this process for multiples of 30, 40, and so on to 90, using several whole number factors. Students will keep a table in their math notebook where they will record these examples. The teacher will model the use of this table on the white board. **Assessment**: After giving a problem on the board, monitor student progress. Circulate to gauge understanding and accuracy of calculations and correct use of place value sticks. Use DOMA screenings and/or formative assessments to identify students at risk of failure with core curriculum, and pool them in RTI tier-2 and 3 groups. With the teacher aide's help, provide tier-2 and 3 students respectively with small group and one-on-one differentiated instruction with concrete-to-pictorial-to-abstract examples, bar modeling, modeling with thinkalouds, reteaching opportunities, extra-practice, tips for helping struggling students, corrective feedback and frequent cumulative review. Lead discussion on the patterns students notice in their products table. Ask questions such as, "how are the numbers (products) changing as we move down/up/across the table." Give base groups a chance to converse before the whole-class share. **Independent Practice**: Invite students to use their place value sticks to "fill in the gaps" in their table. Encourage students to begin with the 10s, and work their way toward multiplying 90s.	
	Objective: Students will write and solve a multiplication equation from an array, and create arrays to represent multiplication equations. Tell the students today we are going to use a different strategy for representing multiples of 10, 20, 30, etc. Yesterday, we used a concrete way of showing this multiplication, and today we are going to use a pictorial representation. Show students an array on the white board (such as the one to the right) and ask students how many units are in each column. Write this number to the side of the columns (10). Ask students how many	3 10 

2	columns there are? Students will respond, 3. Ask students how they could determine the total number of units in this array. Record the different strategies students share (e.g., count each unit, count by 10s, and multiply 10 by 3). Explain that this array shows 10 x 3 = 30. **Guided Practice**: Repeat this process with several examples (20x4, 30x7, 40x5, etc.) Show the array to the class, and invite them to write the multiplication problem it represents on student white boards. To represent multiples of ten, stack the columns with an indicator separating groups of 10, as shown below (Independent Practice: Day 2). **Assessment**: Monitor student progress and accuracy by assessing work shown on student white boards. **Independent Practice**: Tell students they will now continue to practice writing multiplication problems from arrays, as well as creating arrays to represent multiplication problems. If needed, pull a small group of students and use the place value sticks as a concrete reteaching of arrays. Arrange the place value sticks to aid in the transfer of understanding from concrete to pictorial. With the teacher aide's support, provide at-risk students (RTI tier-2 and 3) with small group or one-on-one differentiated instruction and use differentiated and scaffolding tools such as modeling with thinkalouds, structured discussions, pre-teaching, re-teaching, extra-practices, visual aids and visual presentations. **Assessment**: Review students' independent practice page for accuracy and understanding.	 Students will count the number of units in each column, and the number of columns. Students will discuss strategies for solving the total number in base groups. Students will use arrays to write and solve multiplication problems on their student white boards. Students will work independently on a practice page (printed on graph paper) in which they will write multiplication problems from arrays, as well as create arrays to represent the given multiplication problems.
	Objective: Students will use a multiplication algorithm to solve multiplication problems. Students will build fluency in multiplying multiples of 10 by a whole number. Tell students, now they have built a conceptual understanding of what it means to multiply 10, 20, 30, etc by another number, they will learn a "short cut" to solving these problems. **Guided Practice**: Write 40 x 3 on the white board. Tell students that in multiplication, like addition and subtraction, we work from right to left, beginning with the ones place. Ask students how many ones are in the number 40. Ask them what the product will be when we multiply zero ones by three. Write "0" in the ones place. Ask students what the	Students will respond, zero. Students will respond, zero. Students will respond, twelve. Students will observe we made one hundred and two tens.

3	product would be when we multiply 4 by 3. Write “12” in the tens place. Explain that when we multiplied the 4, we were multiplying 4 tens, or 40 by 3. Our product is 12 tens, or 120. Ask students what they notice about the product. Give students an opportunity to discuss their observations in base groups. Repeat this process with other multiplication problems. Have students show their workings on student white boards. **Assessment**: Monitor class for accuracy and understanding. With the teacher aide’s support, provide at-risk students (RTI tier-2 and 3) with small group and/or one-on-one differentiated instruction with scaffolding and differentiation tools. **Independent Practice**: Tell students that they will now practice some multiplication problems independently. Each student will receive a 9-sided die and a game card. Students will first roll the die to determine the number of tens (factor 1), then roll again to determine the number of ones (factor 2). These factors will be recorded on their game card. Students will write the multiplication equation, then solve. **Assessment**: Monitor class for accuracy and understanding. Provide scaffolding as needed. Collect game cards at the end of class to review accuracy and understanding.	Students will use the multiplication algorithm to solve multiplication problems on student white boards. Students will use a 9-sided die and game card to create multiplication problems. Students will write the equation, and solve.
4	**Objective**: **Students will review the multiplication algorithm, and associate an array with the equation it represents.** **Guided Practice**: Review with students the use of an array to represent a multiplication problem. Show students several arrays, and have them write the corresponding multiplication problem on student white boards. Acknowledge equations beginning with the “tens” factor, and beginning with the “ones” factor. (Show students how turning an array 90 degrees does not change the value.) Review with students the multiplication algorithm by multiplying the ones, then the tens by the one-digit factor. Provide students with several problems to solve on student white boards. **Assessment**: Check student white boards for accuracy and understanding. With the teacher aide’s support, provide at-risk students (RTI tier-2 and 3) with small group and/or one-on-one differentiated instruction and use scaffolding and differentiated tools such as	Students will write equations on student white boards to represent an array. Students will solve multiplication problems on student white boards. Students will take turns writing and solving multiplication problems, drawing arrays, arranging place value sticks, and checking for accuracy.

	modeling with thinkalouds, structured discussions, pre-teaching, re-teaching, extra-practices, visual aids and visual presentations. **Independent Practice**: Tell students that within their base groups, each student will have a unique task. When given a multiplication problem verbally, one student will write the problem on a student white board and solve it using the algorithm. Another group member will represent the problem using place value sticks. A third group member will draw an array on graph paper, and a fourth group member will check for accuracy, then raise his/her hand when all members are completed and correct. The first base group to finish will "win." Group member roles will rotate every 2-practice problems. **Assessment**: The teacher will monitor students, checking for accuracy and understanding.	
5	**Objective: Students will complete a summative assessment in which they will multiply one-digit whole numbers by multiples of 10 in the range 10-90.**	Students will multiply one-digit whole numbers by multiples of 10 in the range 10-90.

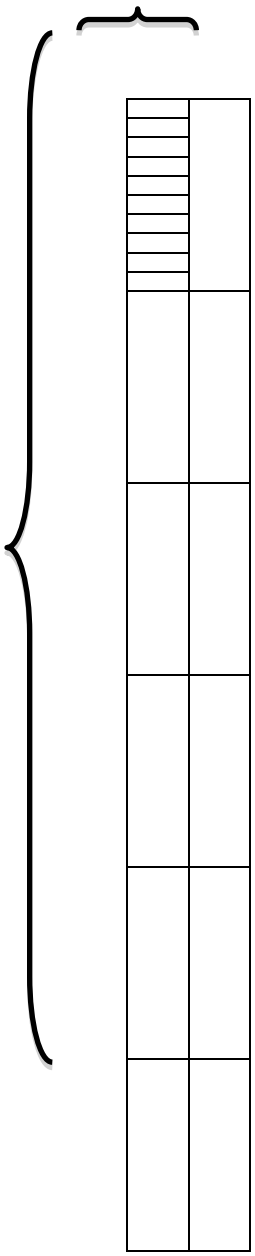
Guided Practice Day 1

Guided Practice (Day 1)

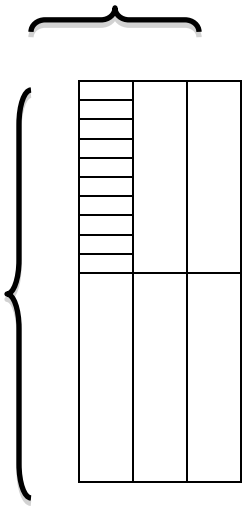
	10	20	30	40	50	60	70	80	90
1	10x1 =10								
2	10x2 =20								
3	10x3 =30								
4	10x4 =40								
5									
6									
7									
8									
9									

Independent Practice: Practice Page (Day 2)

Write the multiplication equation represented by the following arrays, and then solve:



1.Equation: _____



2. Equation: _____

On graph paper, create the following arrays:

3. Draw an array to show 40 x 8.
4. Draw an array to show 50 x 4
5. Draw an array to show 30 x 5

Independent Practice: Game Card (Day 3)			
Factor1 (Multiple of 10)	Factor2	Equation	Answer
20	6	20 x 6	120

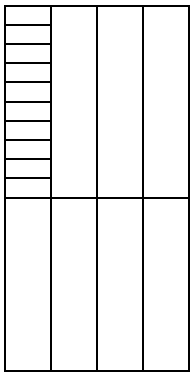
SUMMATIVE ASSESSMENT

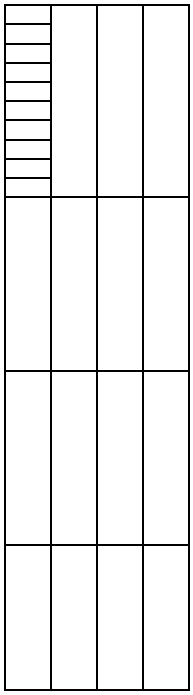
3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.

Solve the following multiplication problems:

1. 40 x 5 = _____
2. 10 x 8 = _____
3. 70 x 6 = _____
4. 50 x 3 = _____
5. 90 x 2 = _____
6. 30 x 7 = _____

Write the multiplication problem represented by the following arrays, then solve.





7. Equation: _____

8. Equation: _____

9. On graph paper, draw an array to represent 10 x 6, and then solve.

10. On graph paper, draw an array to represent 40 x 9, and then solve.

ANSWER KEY

1) 200; **2)** 80; **3)** 420; **4)** 150; **5**) 180; **6)** 210; **7)** 20 x 4 = 80; **8)** 40 x 4 = 160; **9)** Students will draw a 10 x 6 array (60); **10)** Students will draw a 40 x 9 array (360).