Grade 3

Unit	Unit Title	Lesson	Day
1.4	**Introduction to Multiplication – Products of Whole Numbers and Area Related to Multiplication and Addition**	**1 of 4**	**1 - 2**

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.OA.1 Interpret products of whole numbers, e.g. interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 x 7.*	•Recognize the total as the number of separate objects in the group. •Model and skip count objects in equal groups to find out how many total. •Understand that *a* x *b* represents *a* groups of *b* *objects.*	**SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	•What do the factors in a multiplication equation represent? •How do you use equal groups to help you find out how many in all? •How do you use multiplication to determine the product of two whole numbers? •How is multiplication like addition? How is it different?
5. Prerequisite Knowledge	**6. Essential Vocabulary**	**7. Possible Misconceptions**	**8. Necessary Materials**
•Skip count by whole numbers from 1 through 10. •Adding one digit numbers repeatedly. •Model equal groups. •Vocabulary factor & product.	equal groups multiply factor product	•Skip counting only works when each group has the exact same number of objects. •Under or over counting the groups.	**OnCore** Lessons 1 & 2 Student pages 3 – 6 **INV** Unit 5 Student Pages 1-3, 7, 17,18

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will lay the foundation of multiplication (lesson 1) by having students model equal groups and use skip-counting patterns from 2 through 5 to find the total. Explaining that skip counting only works when the objects are arranged in equal groups (there must be the exact the same number of objects in each group). Teachers will also relate repeated addition to multiplication as they guide students through the examples of lesson 2 and INV Unit 5.	Students are developing and practicing their understanding of multiplication by counting equal groups (skip-counting) and relating repeated addition to multiplication. When given an equal groups situation they will model the situation with a drawing and write the related addition and multiplication sentences.

Grade 3			
Unit **1.4**	**Unit Title** **Introduction to Multiplication – Products of Whole Numbers and Area Related to Multiplication and Addition**	**Lesson** **2 of 4**	**Day** **3 - 8**

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.OA.3 Use multiplication…to solve word problems in situations involving equal groups and arrays… e.g. using drawing or an equations with a symbol for the unknown number to represent the problem.* *See Glossary Table 2 CCSS	•Multiply with 2,3,4,6 & 10 using different strategies. •Solve multiplication word problems involving equal groups and arrays. •Model and skip count on a number line to determine how many there are. •Use arrays to model multiplication and find factors.	**SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure. **SMP8** Look for and express regularity in repeated reasoning.	•How do you use multiplication to solve word problems? •How can you use a number line to skip count and find out how many? •How do you use arrays to model multiplication and find factors?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
•Represent whole numbers on a number line. •Skip counting objects in equal groups. •Understand multiplication as combining equal groups.	equal groups arrays doubles	Understanding the difference between what a a 2 x 5 and a 5 x 2 array looks like.	**OnCore** Lesson 6 - 10 Student pages 11 – 20 **INV** Unit 5 Student pages 3-5, 8-9,13-16,25, 29, 32-36

Instruction	
9. Instruction Practices (What are the teachers doing) In *lesson 6* the teacher will review with students how to make a simple number line, pointing out that the spaces between the "tick" marks must be equal. Equal groups will be modeled as a series of jumps on the number line. For *Lesson 7* teachers will model the use of arrays as a visual model way to model multiplication. When objects are placed in an array they are arranged in rows with the same number of objects in each row (forming columns). The total number of objects is found by multiplying the number of rows by the number in each row (column). Teachers will stress the difference in the way a 2 x 5 and a 5 x 2 array look like, even though the resulting product results in the same answer (commutative property). Through lesson 8-10 the teacher will guide students to multiply with 2, 4, 5, 10, 3, and 6. They will review strategies of modeling, number lines, arrays and doubling. Investigations Unit 5 (necessary materials) may be used for additional practice.	**10. Learning Practices (What are the students doing)** Students will practice making number lines making sure that the distance between tick marks are equal. They will model equal groups as equal jumps on student pages 11 & 12. On pages 13 & 14 students will model with arrays. They will see the relationship between a 2 x 5 and a 5 x 2 array, but most importantly understand their difference. On pages 15 – 20 students will practice multiplying with 2,4,5,10,3, and 6 using various strategies. They will continue to understand that when modeling an array for 3 x 5, the array has 3 rows, 5 columns. They will understand how to read 4 x 3 = 12 as "four times 3 equals 12" and that 4 x 3 means "4 groups of 3". As students gain fluency they will begin to apply a doubling strategy. For example, they will know that 3 x 8 = 24, therefore 6 x 8 = 24 + 24 = 48.

Grade 3

Unit	Unit Title	Lesson	Day
1.4	**Introduction to Multiplication – Products of Whole Numbers and Area Related to Multiplication and Addition**	**3 of 4**	**9 – 11**

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.MD.7 a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	•Relate the area of a rectangle to multiplying the side lengths.	**SMP2** Reason abstractly and quantitatively. **SMP7** Look for and make use of structure.	•How can you relate the area of a rectangle to the length of its sides? •How can you find the area of a rectangle using multiplication or addition?

5. Prerequisite Knowledge	6. Essential Vocabulary	7. Possible Misconceptions	8. Necessary Materials
•Working with tiles •Finding area by skip-counting and or addition.	row column area tiles square units (square cm…)	Counting the edges of a tile instead of the space from one edge to the other as 1. For example, if there were 5 tiles on the side of a rectangle, they may say this is equal to 6 units because they count the lines not spaces.	**On Core** Lesson 89 Student pages 177 & 178 **INV** Snap-ins Unit 5 Session 3.1A Student Pages C22 – C29

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide students through the examples of Lesson 89 and INV Unit 5 Snap-ins. They will make connections to prior knowledge by comparing multiplication arrays and area models (noting that in area models there are no gaps between tiles.) Area is measured by finding the number of unit squares that cover a shape. Transition to multiplication by counting the number of rows and the number of squares in each row on a grid. Area formula at later time.	Students will begin work developing the area formula by building rectangles with square tiles or rectangles on grids. They count the number of rows and the number of unit squares in each row and use these numbers as factors to find the area of the rectangle. They will use the appropriate square unit label in their answers.

Grade			
Unit **1.4**	**Unit Title** **Introduction to Multiplication – Products of Whole Numbers and Area Related to Multiplication and Addition**	**Lesson** **4 of 4**	**Day** **12 - 15**

Lesson Focus

1. Standards Addressed	2. Content to be Learned	3. Mathematical Practices	4. Essential Question
3.MD.7c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths *a* and *b* +*c* is the sum of *a x b and a x c*. Use area models to represent the distributive property in mathematical reasoning.	•Illustrate the Distributive Property of Multiplication using rectangles made from square tiles and arrays. •A 5 x 4 array is made up of 5 rows, 4 columns.	**SMP7** Look for and make use of structure.	•How can you use an area or array model to represent the distributive party? •How can the distributive property help you find the area of a rectangle?
5. Prerequisite Knowledge	**6. Essential Vocabulary**	**7. Possible Misconceptions**	**8. Necessary Materials**
•Find the area of a rectangle with whole number side lengths using square tiles. •Multiplication using the "box method".	distributive property array area model factor pairs	•A 5 x 4 array has 5 rows, 4 columns. This distinction is important as the students transition to HS. •Forgetting to add the parts together.	**INV** Snap-In Unit 5 Session 3.1A Student Pages C22-C26, C31 More practice pages are needed. ***Note:*** Oncore Lesson 91 CCSS MD.7c,d will be used Q3, Unit 3.3 with CCSS MD7.d

Instruction

9. Instruction Practices (What are the teachers doing)	10. Learning Practices (What are the students doing)
Teachers will guide students through the Investigations Snap-in lesson 3.5A using arrays and rectangles made from square tiles to illustrate the distributive property. Note: There is an error in the Snap-in lesson p. CC39. The example that is given is a 4 x 9 array (not a 9 x 4). We were asked to count rows first, then columns by HS teachers so that students would not be confused when they study matrixes. Given that this is a 4 x 9, the parts it is broken into should be (4 x 5) + (4 x 4). Even though this will result in the same area due to the commutative property.	Students are practicing finding the area of rectangles by breaking up one of the factors and using the Distributive Property (which relates the operations of addition and multiplication) to find the area. They will be careful to multiply the number or rows by the number of columns, not visa versa. Even though they aware that the product of the columns x rows would result in the same answer due of the commutative property. Students will continue to practice Factor Pairs and Known Multiplication Combinations.