Grade Level	Content Area	Course Title *(For 9-12 Samples Only)*	Unit Title
Grade 3	Mathematics		Multiplication Mania

Length of Unit	Time of Year Taught	Expected Prior Knowledge
4 Days	2nd quarter of first semester	Recognize, skip-count, and compute multiplication for 1s, 2s, 5s, and 10s. Express whole numbers through 4 digits. Be familiar and be able to use a number line in computations including addition and skip-counting. Add and subtract whole numbers to three digits. Solve addition and subtraction word problems using multiple strategies such as guess and check, drawing a picture, and making a number sentence.

Unit Description

Pulling on the students' prior knowledge, the unit begins using literature to show the students that multiplication is a short-cut method for adding equal groups. Throughout the unit the relationship between addition and multiplication is stressed. In addition, the representation of each number in a multiplication equation is explained, practiced and reviewed. The commutative property of multiplication is introduced and practiced.
Bloom's taxonomy target: Comprehension. Upon acquiring knowledge of skip-counting, the student builds on this skill. The student then explores and understands the meaning, translation, interpolation, and interpretation multiplication. The student is able to relate multiplication to addition and state the definition of multiplication in their own words. Students understand, give examples, and illustrate multiplication concepts to begin progress toward application.

Standards: Common Core **Domain:** Operations and Algebraic Thinking **Cluster:** Represent and solve problems involving	**Standard #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.*

Summative Assessment	Students will be assessed on their written ability to: • Describe the relationship between an addition and multiplication numerical sentence • Interpret the products of whole numbers: that is, interpret 6 x 4 as the total number of object in 6 groups of 4 objects each. Summative Assessment attached.
Assessment Scoring	A total of 30 points are available in the assessment. Eighty percent (80%) or above represents unit mastery (24 out of 30 points or better). Answer key attached.
Materials/Resources Needed	**Saxon Math 3** text; *Saxon Math 3 Lesson 45 Part I; Saxon Math 3* **Master 45A/B**; Wrap-Up Manipulatives x1 and x10; **Color** picture showing four monsters each with three eyes; ***Each Orange Had Eight Slices*** by Paul Gigantic, Jr.; Drawing or Picture of 5 roller skates with 4 wheels on each skate; index cards; colored pencils; hole puncher; large metal ring; Classroom display number line 0 – 100; pointer; individual student laminated number lines 0 – 100; dry-erase markers; tissues; "Number Line Hop" worksheet; "Bingo Multiplication" template; multiplication flash cards (up to 9 x 9 facts); counters; in-class computer; projector; individual computers for each student (or one computer for every student pair); and internet access, *Math Summative Assessment.*

This table is consistent with the methods of instruction and assessment described in the narrative.

	Lesson 1 (Day 1)	Lesson 2 (Day 2)	Lesson 3 (Day 3)	Lesson 4 (Day 4)
Instruction and Timeline	Activate Prior Knowledge: Using **Saxon Math 3**, complete *Lesson 45, Part 1 "Multiplying by 1 and by 10; Identifying factors and products."* Follow the lesson directions and orations. Solicit oral answers as directed. Pass out **Saxon Fact Master 45A/B**. Guided Practice: Complete Column A of **Fact Master 45A** together as a class as explained in the lesson. Complete a couple of the problems in Column B as a class (again, as explained in the lesson). Introduce **Fact Master 45B** and the Wrap-Up manipulative drawn on the Fact Master. Explain the directions and complete two each of the x1 and x10 Wrap-Up solutions together as a class. Introduce the Wrap-Up manipulative. Demonstrate the Wrap-Up manipulative's use and provide one to each student. Show students how to check their own work. Allow students time to complete the x1 Wrap-Up manipulative, the x10 Wrap-Up manipulative and **Fact Master 45A**. Independent Practice and Assessment: Have the students complete **Fact Master 45B**. Note to the Teacher: This is the student's first introduction to concept of multiplication using the Saxon textbook. The concept of multiplication will continue to be taught with increasing difficulty in Saxon Lessons 56, 57, 70, 85, 100, 103, 105, 109, 110, 112, 115, 116, 118, 120, 126, and 133. Obtain from the Phoenix public library, ***Each Orange Had 8 Slices*** by Paul Giganti, Jr. Explain to the students that they will be using the book to add equal groups of objects. Hold up a colorful picture of cartoon four monsters	Remind students of the book that was read in class yesterday, ***Each Orange Had 8 Slices*** by Paul Giganti, Jr. Review that multiplication is a shortcut for adding equal sets of objects. Show a picture that shows equal groups of objects, i.e., five roller-skates with four wheels each. Ask the class if they can think of an addition problem for the picture. They may come up with: 4 + 4 + 4 + 4 + 4 = 20 and say, "There are five roller skates and each one has four wheels. There are 20 wheels altogether." Ask them if they remember the shortcut for writing a math problem where each set has an equal amount of objects. Record their observations on the board: 5 x 4, and say "5 groups of 4." Emphasize that in this kind of problem each group has an equal amount. Tell them that today they will begin a "Class Multiplication Book" with pictures that show equal sets of an object. Brainstorm some ideas of what they could draw. Show them an example index card (pre-hole punched at the corner such that later all cards can be attached using a large metal ring) that has 5 roller skates with 4 wheels on each. On the backside of the index card is written, 4 + 4 + 4 + 4 + 4 = 20 and 5 x 4 = 20. The	Activate Prior Knowledge: Have students skip count by 5s aloud as a class to 100: 5, 10 15, 20, 25, 30, …, 100. Using the classroom large number line display, demonstrate with a pointer how hops of 5 can be taken on the number line. Encourage the students to count aloud again as the hops are made. Introduce the lesson: Using the Number Line to Show Multiplication. Introduce the equation notation $4 \times 5 = 20$, informally reading it as "Four hops of five, and you land on 20." After several examples with 5 as a factor, ask the students to determine the number of hops (of 5) to use next. Encourage the students to predict the products. Verify their predictions by moving the pointer on the large number line. Guided Instruction: Provide children with a dry-erase marker, tissue, and an individual laminated number line (from 0 to 100). Ask the students to predict the answers to questions such as "If I take 4 hops of 3, where will I land?" Have them demonstrate using their number line (they should show hopping from 3 … 6 … 9… 12 on their number line). Ask the students to tell you the addition sentence that is represented on the number line (3 + 3 + 3 + 3 = 12). Ask the students to tell you the multiplication sentence that is represented on the number line (4 x 3 = 12). Repeat several times; insure that	Print out the "Multiplication Bingo" card template. Make copies for each student. Write the following numbers on the board: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 25, 27, 28, 30, 32, 35, 36, 40, 42, 45, 48, 49, 54, 56, 63, 64, 72, and 81**.** Have students choose 25 of the numbers and write one in each of the 25 boxes on their template. The numbers can be written in any order desired. When the students are done, use a set of flash cards to randomly choose a multiplication fact. Read the problem aloud. Any student with the product puts a counter marker on it. Continue until someone gets a Bingo. Practice multiplication using computer math games. Using the in-class computer and projector, go to websites: *http://www.ixl.com/math/grade-3/multiplication-sentences*

	each with three eyes. Say, "I see four monsters and each has three eyes." After showing the monster write on the board (using larger than normal size writing) 3 + 3 + 3 + 3 = 12. Point out that each monster has the same number of eyes. Ask students to raise their hand if they see pictures of the same objects that have the same number in each group as you read the story. Begin reading the book. As students raise their hands to share their examples, write these on the chalkboard (again writing larger than normal). Eventually the chalkboard will be filled and crowded with numbers. When this occurs, as the students if they know a shortcut for writing addition problems that are adding equal sets of objects. Erase one of the equations written and replace it with the volunteered shortcut. (Example: 3 + 3 + 3 + 3 = 12 can be replaced with 4 x 3 = 12. As the new math sentence is written, say, "Four groups of three is equal to 12," such that the students grasp the meaning of the numbers.) Ask for more new equation replacement and solicit how to say the equations. As the board becomes less crowded, continue with the story and write new equations as the students volunteer examples.	students illustrate their own picture (using colored pencils) showing equal sets of an object. On the back side of the index card, show the addition number sentence and the multiplication problem which goes with it. Have each child make and complete one index card. Monitor individual student progress and encourage students to write the multiplication such that it is read as "*blank* groups of *blank.*" Collect the illustrations. Choose ten illustrations from the class's pictures to share. As the pictures are shown, each child records a numerical multiplication equation corresponding with the picture on his/her recording sheet. As future **SAXON** multiplication lessons occur throughout the year, have the children make additional cards to add to the "Class Multiplication Book"	all students understand the concept. Then ask: "If I take 5 hops of 3, where will I land? (15) What is the addition and multiplication sentence? (3 + 3 + 3 + 3 + 3 = 15 and 5 x 3 = 15.) How about if I take 3 hops of 5? (15) What is the addition and multiplication sentence? (5 + 5 + 5 = 15) What is the addition and multiplication sentence? (3 x 5 = 15) Will this work every time?" Encourage them to explore the order property using other examples (commutative property) and state their findings. Independent Practice: Provide the student with the worksheet, "*Number Line Hop*." Have the students record the listed hops on their worksheet and write the corresponding addition and multiplication sentences.	and *http://www.ixl.com/math/grade-3/multiplication-facts-to-12* Model how to use the programs. Arrange for students to have their own computer (or two students for every one computer) such that each student (or pairs of students) can play on their own game. Assessment: Provide to students the *Math Summative Assessment.* 80% or better represents mastery of the assessment.
Student Activities and Timeline	Students will participate in oral answers to **Saxon** Lesson 45. Students will complete worksheet **Saxon Master 45A** and **Saxon Master 45B**. Students will demonstrate using the x1 and x10 Wrap-Up manipulatives. Students will participate by giving oral answers to the literature multiplication lesson, ***Each Orange had 8 Slices*** by Paul Giganti, Jr.	Students will make a multiplication picture and corresponding addition and multiplication sentence for the Class Multiplication Book. Assessment: Students will write 10 multiplication sentences using student made multiplication pictures.	Students will orally participate in counting by 5s and then counting by 5s using the class number line. Students will practice using the number line to model multiplication problems and write the corresponding addition and multiplication sentence.	Students will make their own Bingo card and participate in "Multiplication Bingo." Students will use multiplication picture sentences to identify written numerical multiplication sentences using the computer. Students will complete the *Math Summative Assessment.*

3rd Grade Math Summative Assessment

Directions: Read through the example below. Ask questions if you do not understand. Then, complete the problems that follow. Each question is worth 3 points. (Total assessment points available = 30 points)

Example: You have three birds. Each bird has two legs. How many bird legs are there all together?

a. Draw a picture for the above stated problem

b. Write an addition number sentence that shows the problem.

2 + 2 + 2 = 6

c. Write a new math sentence (multiplication) that shows equal groups.

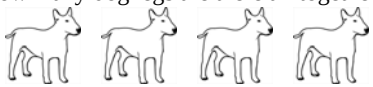
3 x 2 = 6 (three groups of two = 6)

Instructions: Write your answers on a separate piece of paper. For each problem: Draw a picture, write an addition number sentence, and write a new math sentence (multiplication) that shows equal groups.

1. You have four dogs. Each dog has four legs. How many dog legs are there all together?
2. You have two spiders. Each spider has eight legs. How many spider legs are there all together?
3. You have three bees. Each bee has six legs. How many bee legs are there all together?
4. There are five boys in a park. Each boy has three balloons. How many balloons are there all together?
5. There are two apple trees. Each apple tree has five apples. How many apples are there all together?
6. There are four plates. Each plate has five cookies. How many cookies are there all together?
7. There are seven baskets. Each basket has six oranges. How many oranges are there all together?
8. There are six aliens. Each alien has three eyes. How many alien eyes are there all together?
9. There are three boxes of markers. Each box has eight markers. How many markers are there all together?
10. There are seven chairs in the room. Each chair has four legs. How many chair legs are there all together?

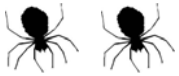
3rd Grade Math Summative Assessment Answer Key

1. You have four dogs. Each dog has four legs.
   How many dog legs are there all together?



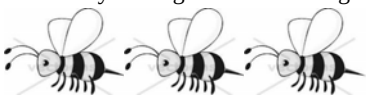
   4 + 4 + 4 + 4 = 16
   4 x 4 = 16 (four groups of four)

2. You have two spiders. Each spider has eight legs.
   How many spider legs are there all together?



   8 + 8 = 16
   2 x 8 = 16 (two groups of eight)

3. You have three bees. Each bee has six legs.
   How many bee legs are there all together?



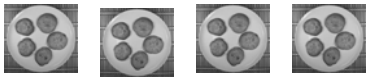
   6 + 6 + 6 = 18
   3 x 6 = 18 (three groups of six)

4. There are five boys in a park. Each boy has three balloons.
   How many balloons are there all together?

   3 + 3 + 3 + 3 + 3 = 15
   5 x 3 = 15 (Five groups of three)

5. There are two apple trees. Each apple tree has five apples.
   How many apples are there all together?
   5 + 5 = 10
   2 x 5 = 10
   (Two groups of five)

6. There are four plates. Each plate has five cookies.
   How many cookies are there all together?



   5 + 5 + 5 + 5 = 20
   4 x 5 = 20 (four groups of five)

7. There are seven baskets. Each basket has six oranges.
   How many oranges are there all together?

   6 + 6 + 6 + 6 = 24
   4 x 6 = 24 (four groups of six)

8. There are six aliens. Each alien has three eyes.
   How many alien eyes are there all together?

   3 + 3 + 3 + 3 + 3 + 3 = 18
   6 x 3 = 18 (six groups of 3)

9. There are three boxes of markers. Each box has eight markers.
   How many markers are there all together?

   8 + 8 + 8 = 24
   3 x 8 = 24
   (Three groups of eight)

10. There are seven chairs in the room. Each chair has four legs.
    How many chair legs are there all together?
    4 + 4 + 4 + 4 + 4 + 4 + 4 = 28
    7 x 4 = 28 (Seven groups of four)

Grading for 3rd Grade Math: The summative assessment has a total of 30 points. There are ten questions, each is worth 3 points.

Grade	Number of Answers correct
A	27 - 30
B	24 - 26
C	21 - 25
D	18 - 20
F	17 and below

Mastery is at 80% and above (24 points or greater)