Third Grade Unit 2: Relate Multiplication and Division

Students needing gifted services should have a journal in which to complete these enrichment activities. These activities can be to supplement or supplant the math material in BYOC, depending on the students' needs. For hard copies of the journal questions and math projects, please see your building gifted specialist.

Topic: Understanding of Multiplication

Learning Target	**Possible Activities**

• I can relate addition and skip counting to multiplication.
• I can illustrate multiplication by thinking about groups of objects.
  ○ Description: use drawings, arrays, measurement quantities, and equations
• I can use the distributive property of multiplication.
  ○ Description: The distributive property in third grade relates to decomposing numbers to multiply one digit by two digits. For example, to solve 12 x 5, you decompose 12 into 10 and 2. Then multiply 10 x 5 and add 2 x 5.
• I can use the associative property of multiplication.
• I can use the commutative property of multiplication.
• I can use what I know about multiplication to solve word problems.
• I can multiply within 100 easily.
• I can use addition, subtraction, multiplication, and division to solve different types of words problems and then use mental math to decide if my answers are reasonable.
• I can quickly and easily multiply any one-digit number with a multiple of 10.
• I can find patterns in addition and multiplication tables and explain them using what I know about how numbers work
	• IXL Math: 3rd Grade
	  ○ Multiplication: E.1-E.17
	  ○ Multiplication Skill Builders: F.1-F.13
	  ○ J.5: Properties of multiplication
	  ○ J.6: Solve using properties of multiplication
	  ○ J.7: Distributive property: find the missing factor
	  ○ J.8: Multiply using the distributive property
	  ○ J.9: Relate addition and multiplication
	  ○ L.6: Estimate Products
	• Math Project: Everyday Arrays
	  ○ to identify and describe arrays in the real world (see gifted specialist for hard copy of this project)
	• Math Journal:
	  ○ I solved a multiplication number story and got an answer of 16. What might the number story have been?
	  ○ The product of two numbers is 24 and their sum is less than 15. What might the two numbers be?
	  ○ Sam rolled two dice and multiplied the results. He got a product that was an even number. What numbers might Sam have rolled?
	  ○ Jess says that 4 groups of 8 are less than 8 groups of 4. Is Jess correct? Explain your thinking.
	  ○ Lisa showed two different ways to use the distributive property to find the product of 12x7. What might they have been?
	  ○ Sarah says the product of 2x3x4 is less than the product of 4x3x2. Is Sarah correct?
	  ○ Write your own multiplication story for 13x6. Show two different strategies that you could use to solve this problem.

	○ I forget what 8x6 is, but know that 5x6 is 30. How can I use this fact to figure out what 8x6 is? ○ I multiplied two odd numbers and got a product that was less than 30. What might the two odd numbers have been? ○ Nancy baked 4 trays of muffins. Each tray held 6 muffins. She took 15 muffins to school for the bake sale and left the rest at home to share with her family. How many muffins did Nancy leave at home? ○ Peter used the basic fact 3+4 to make a patterns to help him find the sum of 30,000 and 40,000. Show Peter's pattern. ○ Start at any number in the bottom row of the multiplication table and move up the right diagonally. Describe any patterns that you may find. ○ Choose two of the following: ___x___=36, ___x___=54, ___x___=72 How many different pairs of numbers can you use to fill the blanks? What are they?

Topic: Understanding of Division

Learning Target	**Possible Activities**
● I can understand division by thinking about how one group can be divided into smaller groups. ● I can find the missing number in a division equation. ● I can use what I know about division to solve word problems. ● I can find the answer to a division problem by thinking of the missing factor in a multiplication problem. ● I can use addition, subtraction, multiplication, and division to solve all kinds of word problems and then use mental math to decide if my answers are reasonable. ● I can divide within 100 easily and quickly because I know how multiplication and division are related.	● IXL Math: 3rd Grade ○ Division: G.1-G.15 ○ Division-Skill Builders: H.1-H.12 ○ J.10: Relate multiplication and division ○ L.7: Estimate quotients ● Math Journal: ○ Using the numbers 3,6, and 18 write a multiplication story and a related division story. Show how you would solve each number story. ○ A teacher wants to place her 24 students into groups with an equal number in each group. How many different wants can the teacher group the students? ○ There are 16 apples to be put into bowls. Each bowl must have the same number of apples. How many different ways can the apples be put into bowls.

	○ Choose one of the following numbers: 18, 20, or 28. Suppose that this many musicians in a marching band were getting ready for a parade. How many different ways could they arrange themselves in equal rows? ○ After listening to 100 Hungry Ants choose one of the following numbers: 12, 24, or 36. Suppose that this many ants were going to a picnic. How many different ways could the ants arrange themselves in equal rows? Show as many different solutions as you can. ○ After listening to The Doorbell Rang choose one of the following numbers: 16, 24, or 32. Suppose that you had this number of cookies. How many friends could you share them with so that you all had an equal share? Show as many different solutions as you can. ○ I solved a division number story and got an answer of 7. What might the number story have been? ○ Mary knows that 4x6=24. How can she use this to find the answer to this problem: 24 cookies are divided into 4 bags. How many cookies are put in each bag? Explain your reasoning. ○ I am not sure of the answer to 21÷7 but know that 3x7=21. How can knowing this multiplication fact help me solve this division problem? ○ The answer to a division question is 3. What might the question be? Record as many different solutions as you can.

Topic: Understanding Area of a Rectangle
Topic: Use Tiling to Measure Area of Rectangles
Topic: Use Side Length to Calculate Area of a Rectangle
Topic: Use Distributive Property to Calculate Area of a Rectangle

Learning Target	Possible Activities

• I can distinguish area as an attribute of a plane figure.
• I can identify a unit square as being a square with side lengths of one unit.
• I can distinguish area as an attribute of a plane figure.
• I can identify a unit square as being a square with side lengths of one unit.
• I can calculate the area of a rectangle using tiling of unit squares.
• I can solve real world area problems using tiling.
• I can calculate the side length of a rectangle using unit squares.
• I can calculate the area of a rectangle when given the side lengths.
• I can show that finding the area of a rectangle by multiplying one side by the addends of the other side separately is the same as multiplying the one side by the sum of the addends of that other side.
• I can use the distributive property as a strategy to calculate area of large rectangles.
	• IXL Math: 3rd Grade
	  ○ R.10 Area of figures made of unit squares
	  ○ R.11 Area of rectangles
	  ○ R.12 Area of squares and rectangles: word problems
	  ○ R.13 Area of complex figures (with all right angles)
	  ○ R.14 Area between right angles
	  ○ R.15 Compare area and perimeter of two figures
	• Math Journal:
	  ○ A rectangle has a perimeter of 18cm. What might its area be? Show as many different solutions as you can.
	  ○ A rectangle has an area of 20 square centimeters. What might its perimeter be? Show as many different solutions as you can.
	  ○ Draw and label a rectangle with an area of 30 square yards that can be enclosed with less than 25 yards of fencing. Verify your solution.
	  ○ Draw three rectangles. Measure the sides of each rectangle to the nearest cm. Label the rectangles to show which was the the shortest and which has the longest perimeter.
	• Math Projects 3-5:
	  ○ Exploring Area: To calculate and compare the the area of rectangular figures using tiling. Please see gifted specialist for project.

Activities Applicable to Every Unit

• Math Project: Design a Game
  ○ design a game based on a math concept
• Math Project: Create a Math Storybook
  ○ create a book based on a math concept
• Math Project: Math Tic-Tac-Toe
  ○ select and complete three activities from a tic-tac-toe board to demonstrate knowledge and understanding of a math concept

3rd Grade Math Journal Rubric

4	**My work shows a thorough understanding of the math in this task.** ● I solved the problem correctly using an efficient strategy. ● My explanation is very clear. I included my **work**, **what** I did and **why** I chose the operation or strategy that I used. ● I effectively used math vocabulary and strategy words from our math word wall, word bank or charts.

3	**My work shows a good understanding of the math in this task.** ● I solved the problem correctly. ● My explanation is clear. ● I used some math vocabulary and strategy words from our math word wall, word bank or charts.

2	**My work shows some understanding of the math in this task.** ● I solved part of the problem correctly <u>or</u> made some small errors. ● My explanation is unclear or incomplete. ● I did not use math vocabulary and strategy words from our math word wall, word bank or charts.

1	**My work shows that I need more help to understand the math in this task.** ● I could not solve the problem <u>or</u> my answer is incorrect. ● I did not include an explanation.