UNIT OF STUDY #3 Multiplication and Division

Title: Relationships Multiplication and Division	Subject/Course: Math	Length: 4 wks
Topic: Multiplication and Division	Grade: 4	Designer: Tammie Nelson Shaundra Flanery Carrie Holt

UNIT GOALS AND EXPECTATIONS

IMPORTANT CONCEPTS:	ESSENTIAL QUESTIONS:
• Multiplication and division are inverse operations. • The divisibility of a number can be determined by using a specific divisibility rule • Arrays and number lines may be used to find factors and multiples. Arrays also may help to find prime or composite numbers. • By building models you will be able to determine the meaning of square numbers. • The remainder represents what is left over after dividing. • Proper procedures are followed to divide. • Basic facts and patterns can be used to estimate quotients. • Identify shapes and mixed shapes that will tessellate. • Rules will be determined based on variables.	• Why is multiplication used to solve problems, and when multiplying numbers do you see a pattern? • How does the properties of multiplication relate to the properties of addition? • Why do you need to know a pair of numbers, instead of just one, to find a point on a grid? • Why is it helpful to learn divisibility rules? • What is the difference between prime and composite numbers? • What is the importance of the remainder in the context of the word problem? • Why are basic facts helpful when multiplying greater numbers?
STUDENT LEARNING EXPECTATIONS: NO.2.4.2b Apply number theory: use the term multiple, factor, and divisible by in an appropriate context NO.2.4.2c Apply number theory: generate and use divisibility rules for 2,5, and 10 NO.2.4.2d Apply number theory: demonstrate various multiplication and division relationships NO.2.4.3a Use conventional mathematical symbols to write equations for contextual problems involving multiplication as grouping/partitioning and price NO.2.4.3b Use conventional mathematical symbols to write equations for contextual problems involving multiplication as multiplicative comparison NO.2.4.4a Represent and explain division as measurement and partitive division including rectangular arrays NO.2.4.4b Represent and explain division as partitive division including equal groups and price. Translate contextual situations involving division	NO.2.4.1 Develop an understanding of the associative and zero properties of multiplication using objects NO.2.4.2a Apply number theory: determine if any number is even or odd NO.3.4.2a Demonstrate fluency with basic multiplication and division facts NO.3.4.2.b Use multiplication and division knowledge to mentally compute related problems using multiples of ten A.4.4.1 Identify a number that is more or less than any whole number using multiples of ten, hundred and thousands A.4.4.2b Use growing numeric and geometric patterns to make predictions and solve problems A.4.4.3 Determine the relationship between sets of numbers by selecting the rule G.10.4.1 Locate and identify points on a coordinate grid and name the ordered pair

into conventional mathematical symbols	
SPECIFIC DECLARATIVE KNOWLEDGE – What I know Vocabulary Words: Inverse Operations, Fact Family, Multiple, Identity, Zero, Commutative, Associative Properties, Variable, Equation, Factor, Product, Division, Divisor, Remainder, Quotient, Dividend, Divisible, Prime, Composite, Square number, Square root, Tessellation, Ordered Pair, X-axis, Y-axis X- coordinate, Y-coordinate *Identify multiplication strategies *Recognize how multiplication and division problems are related. *Recognize numerical patterns in multiples *Identify the relationship between multiplication and addition by using the different properties. *Identify numbers that are divisible by 2, 5, and 10 using divisibility rules. *Identify patterns from numbers that are multiplied by 10, 100, and 1,000	SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do *Write fact families to show inverse operations. *Construct arrays to demonstrate multiplication problems *Use grouping methods to demonstrate division and even and odd numbers *Compare multiplication properties *Locate cue words to choose the best operation for solving the problem * Create equations to solve contextual problems *Model prime and composite numbers and their relationship to being even or odd *Construct tessellations using various geometric shapes, which will reinforce geometric patterns *Locate points using assigned ordered pairs

UNIT ASSESSMENTS (Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)	
*RAFT Activity- Get on the Bus Multiplication (Synthesis) • Role: Bus Driver • Audience: Students • Format: Schedule and Reflection • Topic: Multiplying student passengers *Open Response: Finding Patterns (Application) Scoring rubric will be used. *Small Groups- Finding Factors Activity using various manipulative (Synthesis) Scoring rubrics will be used. *Open Response: Nora's and Julie's Paint Job (Application) Scoring rubric will be used. RAFT Activity-Comic Strip Division (Synthesis) Role: Comic Strip Writers and Artists Scoring rubric will be used. Audience: Comic Strip Readers Format: Comic Strip and Division Problem Topic: Dividing farm animals, video games, ballgames, movies, jewelry, or books	
Traditional Assessments: Quiz over vocabulary TLI quiz Homework/Class work Multiplication test Division test	Other Evidence of Learning: Vocabulary Graphic Organizer

ACTIVITIES AND LEARNING EXPERIENCES	Resources
*Daily prior knowledge will be assessed by using one of the following: KWL charts, brainstorming, anticipation guides, admit slips, think-pair-share and problems of the day. *Introduce unit by showing Multiplication Rock	School House Rock

*Whole Group- Show numeric patterns by skip-counting. Have students practice skip-counting and using the vocabulary word: multiples. *Have students list the multiples in a multiplication table to show numeric patterns. *Practice Fluency of Multiplication facts by doing the following: Harcourt Mega Math, Flashcards, Multiplication Bingo, Multiplication War, Magic-Number Multiplication, Around the World, Dice Works, and Multiplication Game on Calculator. Facts will be practiced daily. This internet resource will also be used to reinforce fluency: http://www.aaaknow.com/g4_34xc1.htm Vocabulary Graphic Organizer on factor and product *Small Groups-Finding Factors Activity using manipulatives (color tiles, counters, milk lids, etc.) Students will create a foldable to compare the properties of multiplication. *Before Reading Anno's Mysterious Multiplying Jar, we will discuss the meaning of multiplication. Read Aloud: Anno's Mysterious Multiplying Jar After reading, have students draw a picture, and have them multiply the picture according to assigned amounts. RAFT Activity Scenario: Students getting on the bus. Task: Create a schedule of when you pick up the students and calculate how many students are being picked daily. You will decide how many students will be riding your bus in an assigned number of days in your reflection. *Pairs- Students will create fact families on butcher paper. *Use arrays to show prime and composite numbers. *Introduce Division by watching a united streaming video *Introduce Divisibility Rules using Harcourt Intervention. Small Groups- Create a divisibility rap. *Before reading A Remainder of One, put students in two groups. Determine if the groups are equal. If they are not, use that to explore remainders. Also, discuss even and odd numbers. Read Aloud: A Remainder of One After reading, the students will perform a RAFT activity. *RAFT Activity Scenario: Create a comic strip that represents a division problem. Task: The students will create a comic strip where a division problem is posed. The students must choose a comic strip that talks about barn animals, video games, jewelry, ballgames, movies, or books. *Small Groups- How remainders impact an answer in real-world situations. Use the website: http://wwww.math.niu.edu/courses/402/packet/packet-4.pdf *Use Dry Erase Boards: Division Word Problems on www.mathplayground.com *Read Aloud- X Marks the Spot. Students will plot their own treasure hunt. Students will plot their initials on a coordinate grid using stickers. *Small Groups-Reinforce Coordinate Grid using Harcourt Intervention. *Use geometric manipulatives to make patterns *Students will use geometric figures to participate in a tessellation competition. Students will have a secret vote to determine the winner.	The Mailbox Harcourt Building Academic Vocabulary by Marzano and Pickering Teaching Student-Centered Mathematics by Van de Walle and Lovin Masaichiro and Mitsumasa Anno unitedstreaming Pinczes Harcourt Internet Penner The Mailbox Harcourt
Career Connections	
Bus driver, Comic Strip writers and illustrators, and Musicians	