UNIT OF STUDY #2 Mathematical Relationships and Problem Solving

Title: Mathematical Relationships and Problem Solving	Subject/Course: Math	Length: 3 wks
Topic: Solving Mathematical Problems	Grade: 4	Designer: Shaundra Flanery Tammie Nelson Carrie Holt

UNIT GOALS AND EXPECTATIONS	
IMPORTANT CONCEPTS: *Variables represent an unknown number *The rule must apply to every number in a pattern *Some problems are best solved using equations and some are best solved expressions *Tessellations only occur when there are no gaps between shapes *Basic factors and facts and patterns can be used to estimate quotients *Basic facts and patterns can be used to multiply mentally to increase fluency *Base ten blocks can be used to represent the relationship between place value, addition and subtraction	ESSENTIAL QUESTIONS: *What is the relationship between patterns and functions (rules)? *How are symbols used to represent mathematical relationships?
STUDENT LEARNING EXPECTATIONS: NO.3.4.1 Demonstrate, with and without appropriate technology, computational fluency in multi-digit addition and subtraction in contextual problems A.4.4.3 Determine the relationship between sets of numbers by selecting the rule NO.3.4.5 Use estimation strategies to solve problems and judge the reasonableness of the answer A.4.4.2a Use repeating numeric and geometric patterns to make predictions and solve problems A.5.4.2 Express mathematical relationships using simple equations and inequalities A.5.4.3 Use a variable to represent an unknown quantity in a number sentence involving contextual situations and find the value	
SPECIFIC DECLARATIVE KNOWLEDGE – What I know *Identify relationships between sets of numbers *Understand meanings of operations and how they relate to one another *Identify various strategies to use for problem solving *Vocabulary Words: estimate, fact family, sum, difference, numeric patterns, tessellations, addend, equations and variables	SPECIFIC PROCEDURAL KNOWLEDGE – What I need to do *Compute fluently and make reasonable estimates *Use various manipulatives to represent equations and problem solving strategies *Complete input/output tables and numeric patterns based on a rule *Determine a rule for a pattern or input/output based on data and construct an equation using a variable that represents the rule

UNIT ASSESSMENTS (Include tasks related to Dimensions 3 and 4 and Bloom's Taxonomy)
*Open Response-School Supplies Scoring rubric will be used *Open Response-Numeric Patterns on Rules Scoring rubric will be used *Cities, USA Math Lab Activity *RAFT-place value and addition Role: Chef Audience: Fellow Chefs Format: Place value chart and short answer Topic: Number of noodles of different countries

Traditional Assessments:	Other Evidence of Learning:
*Quiz on vocabulary *TLI Quiz *Homework/Class work	

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 Before Reading: *Write on the board: Facts We Know about sea turtles, Questions we Have about sea turtles, What We've Learned about sea turtles *Read Aloud- <u>One Tiny Turtle</u> After Reading: Questioning: About how many eggs does the Loggerhead turtle lay in her lifetime? Write these facts on the board: 1. On the nesting beach, females make 4-10 nests. 2. They lay about 100 eggs in each nest. 3. For 30 years you might not find her. Then one summer night she arrives on the beach where she was born. Have students write what they have learned about sea turtles from the book *Pairs- Addition and Subtraction Flashcards to increase fluency *Individual Practice- Use a calculator to play the addition and subtraction facts game *Whole Group- Addition and Subtraction Video *Whole Group- 4 step vocabulary: addends, sum, difference, and fact families *Small Groups- Construct addition and subtraction fact families to show they are inverse operations *Small Groups- Whisper Down the Lane Activity: Ten students will be standing in a line by the whiteboard. The first student will be given a sheet that shows an addition or subtraction problem. The sheet will then be taken away. The	Marilyn Burns UntiedStreaming.com 4-step vocabulary sheet The Math Lab by Bernstein

students must whisper the problem in the next student's ear and so on till it gets to the end of the line. That student must then write the problem on the board and solve it. The first students will then be given the sheet and write the problem down on the board and solve it. The students will check to make sure the problems match. *Pairs Cities USA Activity: The students will be finding specific American cities using the letters and assigned letter values. Write the name of a U.S. city and then, according to the numbers assigned to each number, add all of the numbers and arrive at a sum. For this activity, the sum must be a specific total. *Teacher Model: Open Response Relationships between sets of numbers. *Raft Activity Scenario Noodles Task: 1. Place Value Chart-Compare number to find the country with the greatest/least amounts of noodles. 2. How many noodles were from countries that started with "U"? Estimation of Sums and Differences: *Set up estimation stations 1. Smart board station: Harcourt rounding 2. Money station: estimate totals and change 3. White board station: teacher provided estimation problems 4. Released items station: "small group" work with teacher *Whole group problem solving "Playground Math" and Harcourt Mega Math *Games (subtraction) Input/Output Tables *Read Aloud: Two of Everything, Questioning: What happen when an item fell into the pot? Did that happen every time? *Cooperative Learning Groups: Students will be given a list of numeric patterns and they will have to determine the rule. Individually, we will give them a rule and they will have to create their own numeric pattern. Students will write equations that represent the rule to the pattern.	The Math Lab by Bernstein Math Word Problems Made Easy by Krech
Career Connections	
Geographer, Travel Agent, Chef and Cashier	

OPEN RESPONSE RUBRIC

SCORE	DESCRIPTION
4 – ADVANCED	**Student earns 4 points.**
3 – PROFICIENT	**Student earns 3 points.**
2 - Basic	**Student earns 2 points.**
1 - Below Basic	**Student earns 1 point.** **OR** **Student shows minimal understanding of the concept.**

*** Students will receive 0 points for incorrect or irrelevant explanations and work.**