Understanding by Design

Designer Name(s): Young and Cowsert Date: 6/10/14

Subject Area: Math Grade Level(s):3rd

Unit Title/Focus: Section 13 (Lessons 121-130)

Estimated Amount of Instructional Time: ~ 14 days

Stage 1 – (Desired Results)

State Content and Skill Standards: CCSS and section overview card

Mathematic Claim #1: Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Domain: Operation and Algebraic Thinking

Target A. (3.OA.A) Represent and solve problems involving multiplication and division. (DOK 1)

Gr. 3 Standards: 3.OA.1, 3.OA.2,3.OA.3, 3.OA.4

3.OA.1: Interpret products of whole numbers, e.g., interpret 5×7 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 5×7.

3.OA.2: Interpret whole-number quotients of whole numbers, e.g., interpret 56÷8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56÷8.

3.OA.3: Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

3.OA.4: Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = □ ÷ 3, and 6 × 6 = ?.*

Target B. Understand properties of multiplication and the relationship between multiplication and division. (DOK 1)

Gr. 3 Standards: 3.OA.6

3.OA.6 Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*

Target C.(3.OA.C) Multiply and divide within 100. (DOK 2)

Gr. 3 Standards:3.OA.7

3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3 know from memory all products of two one-digit numbers.

Target D.(3.OA.D) Solve problems involving the four operations, and identify and explain patterns
in arithmetic. (DOK 2)

Gr. 3 Standards: 3.OA.8, 3.OA.9

3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*

Enduring Understandings: *(what are the big ideas, what are the specific understandings desired)*	*Essential Questions:* *(what questions will foster inquiry, understanding, and transfer of learning)*
Students will understand that… • To divide a 1-digiti divisor, division, multiplication, and subtraction are used • Long distances are measured using miles or kilometers • A scale is used to find distance on a map • Unit cost can be found by dividing	• When I divide a 2-digit number by a 1-digit number, what do I do first? • What are some distances I can measure using miles or kilometers? • How will I use a scale to find the distance between two cities on a map? • If two erasers cost $0.10, how do I find the cost of 1 eraser?

Big Idea(s)/ Real World Application

Students will be able understand and use the algorithm for long division.

Students will be able to read a map to determine the distance between cities using miles or kilometers.

Students will be able to determine the cost of one item in a unit set.

What Students will know: *(what knowledge will they acquire)*	*What Students will be able to do:* *(what will they eventually be able to do as a result of their skills learned/knowledge)*
Math Vocabulary: compass rose, coordinate plane, direction, infinity, kilometer, line, mile, negative number, ordered pair, origin, positive number, topology, unit cost • Volume of a rectangular prism is the amount of 3 dimensional space an object occupies. • Volume = length x width x height • Basic Division Problems • Numbers to the left of 0 are negative numbers • Numbers to the right of 0 are positive • To find unit cost, divide total cost by number of items in unit • Important map features such as compass and scale • Map scale refers to the relationship between a distance on a map and a corresponding distance on the ground	(Saxon Lesson Objectives) Students will be able to • Find Volume of Rectangular Prism • Divide 2 and 3-Digit Multiples of 10 by a 1-Digit Number Using Mental Math • Locate Negative Numbers on a Number Line • Determine Unit Cost, Dividing by 6, 8, and 9 • Locate Information on a Map • Show Addition, Subtraction, and Multiplication on a Number Line • Identify Units of Measure for Long Distances and Using a Scale to Find Distance on a Map • Add Positive and Negative Numbers • Graph Points on a Coordinate Plane and Solving a Problem by Making it Simpler

• The first number in an ordered pair represents horizontal movement and the second number represents vertical movement • To determine if the number stays the same or rounds up is based on the number to the right of the rounding digit	• Show Large Numbers Using Objects, • Round Numbers to the Nearest Thousand ,and Comparing and Ordering 6-Digit Numbers

Stage 2 - Assessment Evidence (acceptable assessment evidence that students understand)

Performance Tasks: (what authentic performance task (s) will students demonstrate understanding; by what criteria will it be judged?)	*Other Evidence: (quizzes, tasks, academic prompts, homework, observations)*
• Use cubes to find volume of a rectangular prism • Create a number line with positive and negative numbers • Have children use mneumonic phrase to help remember the division steps in the division algorithm • Use a map of the United States to measure distances between citites • Create a table to find single cost within a unit • Use a number line to illustrate addition and subtraction with positive numbers • Construct a Coordinate Grid and graph points given the ordinate pair) to create a design • Solve a word problem by making it simpler	• Cumulative Written Assessments 125-1, 125-2, 130-1, 130-2 • Oral Assessment 13 • Teacher Observations • Guided Practice • Homework Practice • Fact Practice

Stage 3 - Learning Plan (sequence of teaching and learning activities that will produce desired understandings, engagement and development) Use WHERETO elements to help you:

Learning Activities:

Saxon Table of Contents Section 13

Lesson 121- Finding Volume of Rectangular Prism
Lesson 122- Dividing 2 and 3-Digit Multiples of 10 by a 1-Digit Number Using Mental Math
Lesson 123- Locating Negative Numbers on a Number Line
Lesson 124- Dividing a 2-Digit Number by a 1-Digit Number
Lesson 125-1- Determining Unit Cost, Dividing by 6, 8, and 9
Lesson 125-2- Locating Information on a Map
Lesson 126- Showing Addition, Subtraction, and Multiplication on a Number Line
Lesson 127- Identifying Units of Measure for Long Distances and Using a Scale to Find Distance on a Map
Lesson 128- Adding Positive and Negative Numbers
Lesson 129- Creating a Coordinate Place and Identifying Location of a Point on a Coordinate Plane
Lesson 130-1- Graphing Points on a Coordinate Plane and Solving a Problem by Making it Simpler
Lesson 130-2- Showing Large Numbers Using Objects, Rounding Numbers to the Nearest Thousand ,and Comparing and Ordering 6-Digit Numbers

Journal Writing:

- You and three of your friends found a $100 bill in front of the school. What would you do? (Lesson 122)
- Write a division story problem involving a two-digit and one-digit number. (Lesson 124)
- What state would you like to visit? Explain why you would like to visit that state. (Lesson 125-2)
- Design a game that uses a number line. Explain how to play the game (Lesson 126)

W=help the students know WHERE the unit is going and WHAT is expected/Help teacher to know where the students are coming from (prior knowledge, interests)
H=HOOK all students and hold their interest
E=EQUIP students, help them EXPERIENCE the key ideas and EXPLORE the issue
R=Provide opportunities to RETHINK and REVISE their understanding/work
E (2)=Allow students to EVALUATE their work

T=Be TAILORED (personalized) to different needs, interests, and abilities of learners
O=Be ORGANIZED to maximize initial and sustained engagement as well as effective learning

Assessment Tasks that Provide Evidence for Claims including DOK	**Claim #1/DOK 1, 2, 3, 4 (circle one):**
	Claim #2/DOK 1, 2, 3, 4 (circle one):
	Claim #3/DOK 1, 2, 3, 4 (circle one):
	Claim #4/DOK 1, 2, 3, 4 (circle one):
Achievement Level Descriptors	**ALD #1: ALD #2: ALD #3: ALD #4: (circle one):**
Materials/Resources	**Saxon Math**