Understanding by Design

Designer Name(s): Young and Cowsert   **Date:** 6/9/14

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

Unit Title/Focus: Section 11 (Lessons 101-110)

Estimated Amount of Instructional Time: ~ **14 days**

Stage 1 – (Desired Results)

State Content and Skill Standards: <mark>CCSS and section overview card</mark>

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.5,3.OA.6

3.OA.5 Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative Property of Multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative Property of Multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive Property.)*

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.*

Domain: Numbers and Operations in Base Ten

Target E. (3.NBT.E) - Use place value understanding and properties of operations to perform multi-digit arithmetic. (DOK 1)

Gr. 3 Standards: 3.NBT.2

3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.

Domain: Geometry

Target K.(3.G.A) Reason with shapes and their attributes. (DOK 1, 2)

Gr. 3 Standards: 3.G.1

3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

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… • A comma is used to separate the thousands from the hundreds • Each digit in a number has a value • We can write multiplication and division fact families	• Where do I place a comma in a 6 digit number? • How do I find the value of each digit in the number? • What number sentence will I write for a multiplication and division fact family? • How do I find the missing addend for the sum of 100?

• Symbols are used to represent missing addends	Extend and Challenge Questions • Activity 11- What patterns to do you see on the charts of the multiples of nine? • How could you color the charts quickly without counting by nines?

Big Idea(s)/ Real World Application

Students will be able recognize the relationship between multiplication and division

Students will be able to correctly make change for a dollar with a given purchase.

Student will be able to find the missing addend.

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: half hour, intersecting lines, perpendicular lines, reflect, rotate, thousands, total, translation, Venn diagram • The relationship between multiplication and division by listing fact families • Symbols are used to represent a missing addend in an equation • A number has value based on the placement of its digits (place value-ones, tens, hundreds, etc.) • A comma is needed to separate groups within place value (thousands, hundreds)	(Saxon Lesson Objectives) Students will be able to • Find a Missing Addend • Make Change • Read and Write 6-Digit Numbers • Divide by 3 and 4 • Identify Perpendicular Lines • Add Money Amounts • Write Number Sentences for Division Story Problems • Multiply by 10, 100, 1,000, and 9

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)
• Solve a Problem by Making it Simpler • Making a Table to Solve a Problem • Identify Transformations • Identifying Perpendicular Lines and Line Segments	• Cumulative Written Assessments 105-1, 105-2, 110-1, 110-2 • Oral Assessment 11 • 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 11

Lesson 101- Finding the Missing Addend for a Sum of 100
Literature Connection: The Doorbell Rang by Pat Hutchins
Lesson 102- Making Change from $1.00
Lesson 103- Reading and Writing 6-Digit Numbers and Multiplying by 100 and 1,000
Lesson 104- Writing a 4-Digit Number in Expanded Form

Lesson 105-1- Dividing by 3 and 4
Lesson 105-2- Identifying Perpendicular Lines
Lesson 106- Adding and Writing Checks for Money Amounts to 99,999.99
Lesson 107- Writing Number Sentences for Division Story Problems
Lesson 108- Writing Number Sentences for Division Story Problems
==Literature Connection: The Doorbell Rang by Pat Hutchins==
Lesson 109- Multiplying a Multiple of 10, 100, or 1,000 by a single digit number
Lesson 110-1- Multiplying by 9 and Solve a Problem by Making it Simpler
Lesson 110-2- Identifying Transformations, Translations, Rotations, and Reflections

Journal Writing:
- You bought a pencil for $0.18. You gave the cashier $1.00. The cashier gave you three quarters and a nickel for change. What would you say to the cashier? (Lesson 102)
- There are 12 children. Write a story problem about dividing the children into equal groups. (Lesson 107)
- Write a story problem for the number sentence 45 divided by 5. (Lesson 108)
- Explain why it is easy to use mental math to find the answer for 5 x 800. (Lesson 109)

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