Understanding by Design

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

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

Unit Title/Focus: Section 6 (Lessons 51-60)

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.1, 3.NBT.2

3.NBT.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

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.

Target F. (3.NF.A) - **Develop understanding of fractions as numbers. (DOK 1, 2)**

Gr. 3 Standards: 3.NF.1,3.NF.2a, 3.NF.2b,3.NF.3a, 3.NF.3b,3.NF.3c

3.NF.1 Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.

3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line.

b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

3.NF.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.

b. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$. Explain why the fractions are equivalent, e.g., by using a visual fraction model.

c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*

Domain: Measurement and Data

Target G. (3.MD.A)- **Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (DOK 1, 2)**

Gr. 3 Standards: 3.MD.2

3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (L). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

Target H. (3.MD.B)- Represent and interpret data. (DOK 2)
Gr. 3 Standards: 3.MD.3, 3.MD.4
3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*
3.MD.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

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… • Multiplication can be used to find the total number in several groups if each group has the same number. • When we answer questions about how many groups there are in a given number, we are dividing. • Length can be measured to the nearest half inch. • Pictures can be used to find how many things there are all together.	• How do I know when to use multiplication to solve a problem? • When we write equal-groups number sentences, what do I write first? Second? • How do I find the length of a line segment to the nearest half inch? • How do I draw a picture for an equal groups story? Extend and Challenge Question • Make up another story problem about children buying tickets- Activity 5 • What do you look for when you try to find the two halves of a symmetrical design?- Activity 6

Big Idea(s)/ Real World Application

Students will be able recognize that multiplication is equal groups combining to make a larger number.

Students will be able to recognize that division is splitting a larger number into smaller equal groups.

Students will use their knowledge of cups, tablespoons, and teaspoons to follow a recipe.

Students will be able to measure line segments using half inches.

Students will be able to create shapes showing symmetry.

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- addition algorithm, consecutive number, divide, division bar, division box, equal groups, line of symmetry, quotient, symmetric design • Numbers have value based on the placement of their digits	(Saxon Lesson Objectives) Students will be able to • Create a Number Line • Add 2 Digit Numbers Using the Addition Algorithm

- Consecutive numbers increase by 1 - Numbers on a number line have equal distances between them and can be broken into segments - Using the addition algorithm increases the total value of the numbers combined - Multiplication is equal groups combining to make a larger number - Division is splitting a larger number into smaller equal groups. - Placement of a line determines its given name - Capacity is the amount a container holds - Capacity is measured in cups, tablespoons, and teaspoons - A line of symmetry has the exact same image on either side	- Use Estimation to See if Your Answer Is Reasonable - Draw and Measure Line Segments to the Nearest Half Inch - Multiply by 7 - Estimate Capacity - Write Number Sentences for Equal Group Stories - Identify and Draw Lines of Symmetry - Write Division Problems in 3 Ways - Divide by 10, 7, and 1 - Subtracting 2 Facts

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 check and Guess to Determine Consecutive Page Numbers **Draw Pictures and Write Number Sentences for Equal Group Stories** **Draw Picture to Show How Full a Cup is (Fractions)**	- Cumulative Written Assessments 55-1, 55-2, 60-1, 60-2 - Oral Assessment 6 - Teacher Observations - Guided Practice - Homework Practice - Fact Practice

6Stage 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 6==

Lesson 51- Number Line- Does Not Align to Common Core- Grade 2 Review
Lesson 52- Adding 2-Digit Numbers- Grade 2 Review
Lesson 53- Adding 2-Digit Numbers- Grade 2 Review
Lesson 54- Drawing and Measuring Line Segments to the Nearest Half Inch- Grade 2 Review
Lesson 55-1- Multiplying by 7
Lesson 55-2- Locating and Naming Points on a Number Line with a Scale of 10, Estimating Capacity
Lesson 56- Writing Number Sentences for Equal Group Stories
Lesson 57- Writing Number Sentences for Equal Group Stories
==Literature Connection: Each Orange Had Eight Slices by Paul Giganti Jr.==
Lesson 58- Lines of Symmetry
Lesson 59- Division Problems- 3 Ways
Lesson 60-1- Subtraction Facts- Does Not Align to Common Core – Grade 2 Review
Lesson 60-2- Measuring with Cups, Tablespoons, and Teaspoons, Reading a Recipe

** Per conversation with Mrs.Ybarra, if you feel this review is not necessary for your class, skip lessons as needed.**

Journal Writing:
- What is your favorite restaurant? Write about your favorite meal at that restaurant and estimate the cost. (Lesson 52)
- Write about a time when someone was unreasonable. (Lesson 53)
- Explain how to use a wrap-up to a new student in your classroom. (Lesson 55-1)
- Draw the front of your dream house. Make it have a line of symmetry and describe your dream house. (Lesson 58)

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**