

Understanding by Design

Designer Name(s): Young and Cowser

Date: 6/9/14

Subject Area: Math

Grade Level(s):3rd

Unit Title/Focus: Section 7 (Lessons 61-70)

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. 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.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 $8 \times ? = 48$, $5 = \square \div 3$, and $6 \times 6 = ?$.

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 $8 \times 5 = 40$, one knows $40 \div 5 = 8$) 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.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.

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

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.1

3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Target I. (3.MD.C)- Geometric measurement: understand concepts of area and relate area to multiplication and to addition. (DOK 2)

Gr. 3 Standards: 3.MD.5a, 3.MD.5b,3.MD.6,3.MD.7a,3.MD.7b,3.MD.7d

3.MD.5 Recognize area as an attribute of plane figures and understand concepts of area measurement.

a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.

b. A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

3.MD.6 Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

3.MD.7 Relate area to the operations of multiplication and addition.

a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.

d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.

Enduring Understandings: (what are the big ideas, what are the specific understandings desired)

Students will understand that...

- Fractions are used to describe a part of a set
- Mathematicians have certain numbers that they call square numbers
- Symbols such as a square or a triangle are used to take place of a missing part of a number sentence

Essential Questions: (what questions will foster inquiry, understanding, and transfer of learning)

- How do I write a fraction to represent a given part of a set?
- What do the two numbers in the fraction tell me?
- How is a square shape like a square number?
- How do I write a number sentence for an addition story problem that has missing information at the beginning of the story?

Extend and Challenge Question

- Activity 7- Which base 10 blocks would you use to show the number 418?
- Activity 7- What is the largest and smallest numbers you can show using 6 base 10 blocks?

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 understand a square number is a number multiplied by itself- constructing a visual of a square.

What Students will know: (what knowledge will they acquire)

Math Vocabulary- algebra, counter clockwise, equation, exponent, line graph, perfect square, place value, sevenths, square number, volume, one cubic unit, ten cubic units, one hundred cubic units, one thousand cubic units

- Numbers have value based on the placement of their digits
- 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
- A square number is a number multiplied by itself and construct a visual of a square
- Part of a set can be represented using a fraction bar (___ parts out of ___ whole)
- Removing a number decreases the value of the whole number by the given amount
- How to draw a picture representing a number using the base 10 blocks
- How to set and read a temperature on an oven dial
- Find a missing addend in a story problem
- Numbers can be represented in digits and words
- Information that changes over time can be placed on a line graph for quick information gathering

What Students will be able to do: (what will they eventually be able to do as a result of their skills learned/knowledge)

(Saxon Lesson Objectives)

Students will be able to

- Write a part of a set as a fraction
- Subtract a multiple of 10 from a number
- Square numbers and identify perfect squares
- Show 3 or 4 digit numbers using base 10 blocks
- Subtract 3 and 4 Facts
- Follow a recipe,
- Set a dial
- Find elapsed time
- Find the missing addend to some, some more stories
- Subtract 2-digit numbers
- Write numbers to 1,000 using words
- Add and subtract multiples of 100
- Multiply by 2

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)

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| <ul style="list-style-type: none"> • Draw a Picture and Make a Table to Solve for Total Number in a Pattern • Draw and Read a Line Graph • Record Daily Temperatures on a Line Graph • Read and Record Temperature on an Oven Dial | <ul style="list-style-type: none"> • Cumulative Written Assessments 65-1, 65-2, 70-1, 70-2 • Oral Assessment 7 • Teacher Observations • Guided Practice • Homework Practice • Fact Practice |
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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 7

- Lesson 61- Writing Part of a Set as a Fraction
- Lesson 62- Subtracting a Multiple of 10 Using Mental Computation- Grade 2 Review
- Lesson 63- Squaring Numbers
- Lesson 64- Showing 3 and 4 Digit Numbers using Base 10 Blocks
- Lesson 65-1- Subtraction Facts- 3 and 4 - Grade 2 Review
- Lesson 65-2- Following a Recipe, Setting a Dial, and Determining Elapsed Time
- Lesson 66- Identifying the Missing Addend in a Some, Some More Story
- Lesson 67- Subtracting 2 Digit Numbers- Grade 2 Review
- Lesson 68- Writing Numbers to 1,000 Using Words
- Lesson 69- Adding and Subtracting Multiples of 100- Grade 2 Review
- Lesson 70-1- Multiplying by 2 and Looking for a Pattern to Solve a Problem
- Lesson 70-2- Drawing and Reading a Number Line

** 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 way to practice facts: wrap ups, oral fact practice, or fact sheets? (Lesson 64)
- Describe something you made or would like to make using a recipe. (Lesson 65-2)
- Write a some, some more story problem with a missing addend. (Lesson 66)
- What do you like best about math this year? (Lesson 67)
- What is your favorite meeting board job when you are student of the day? Why is this your favorite job? (Lesson 69)

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

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| Assessment Tasks that Provide Evidence for Claims including DOK | <input type="checkbox"/> Claim #1/DOK 1, 2, 3, 4 (circle one): |
| | <input type="checkbox"/> Claim #2/DOK 1, 2, 3, 4 (circle one): |
| | <input type="checkbox"/> Claim #3/DOK 1, 2, 3, 4 (circle one): |
| | <input type="checkbox"/> 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 |

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