Designer Name(s): 4th Grade Team   **Date:**

Subject Area: Math   **Grade Level(s): 4th**

Unit Title/Focus: Lessons 101-110, Investigation 11

Estimated Amount of Instructional Time: 13 days (1 day per lesson/investigation, 1 day for testing, 1 day for Performance Task Activity)

Stage 1 – (Desired Results)

State Content and Skill Standards:

4.OA (Operations and Algebraic Thinking)

3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. 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.

4.NBT (Numbers and Operations in Base Ten)

1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NF (Numbers and Operations – Fractions)

1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

   a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

   b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.

   c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

   d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

   a. Understand a fraction a/b as a multiple of $1/b$.

   b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.

   c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.

6. Use decimal notation for fractions with denominators 10 or 100.

4.MD (Measurement and Data)

1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

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 part of a whole that has been divided into ten equal parts can be named using a fraction and a decimal number. • When dividing a three-digit number by ten, the remainder is the last digit of the dividend. • A mixed number is a whole number plus a fraction.	 • How can we name the part of a whole that has been divided into ten equal parts? • What is the remainder when we divide a three-digit number by ten? • What do we call a number made up of a whole number and a fraction?

Big Idea(s)

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
Represent and interpret data.

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 – schedule, table, a.m., degree, foot, hour, meter, minute, p.m., span, centimeter, decimal number, estimate, fraction, hundredth, millimeter, mixed number, number line, round, segment, sum, tenth, whole numbers, area, denominator, equal to, greater than, less than, numerator, perimeter, square inch, division, improper fraction, remainder, digit, dividend, pound, weight, whole numbers, yard, outcome, Distributive Property, area, expression, formula, product, rectangle, side, square, square unit, equivalent fraction, congruent, reflection, rotation, translation, property, division, multiple, quotient, cubic units, volume, cube, estimate, foot, inch, meter, multiplication, rectangular solid • Understand how to read a graph or schedule to gather information. • Understand the relationship between the scale on a ruler and the scale on a number line to tenths and hundredths. • Show understanding of fractions equal to 1 and equal to ½ . • Understand that an improper fraction has a numerator greater than the denominator. • Demonstrate knowledge of fractions by showing an improper fraction as a mixed number. • Understand how to use division to turn an improper fraction into a mixed number • Show understanding of the division process by being able to divide by 10. • Understand that you can use multiplication to check the answer to a division problem. • Accurately evaluate expressions when given the value of the variable. • Understand that when adding fractions we add the numerators but not the denominators, with the same rule applying to subtraction fractions. If there is a whole number perform the operation as usual with the whole numbers.	 • Follow a schedule by reading and understanding it • Use knowledge of multiples of 10 to quickly divide by 10's • Find the area and perimeter of the pig pen so you can buy supplies to fence it and put a roof on it (doesn't have to be a square or rectangle shaped pen) • Find the volume of the pig's water trough so you can figure out how many buckets of water you will need to haul to fill it up • Be able to double or half a recipe • Know that if there were 5 pizzas cut into 6 slices each and your family ate 18 of the 30 slices of pizza your family at 3 whole pizzas to themselves • If you always wear 3 different bracelets every day figure out how many different bracelets you wear in 2 days, a week, a month, a year? • Gather information from a graph, chart or table

- Understand how to use the common formulas for area and perimeter of a square and rectangle.
- Understand that some figures are made up of several different shapes and those smaller shapes can be used to find the area and perimeter of the larger shape.
- Understand how to apply the distributive property to the formula for the perimeter of a rectangle.
- Understand that different fractions can name the same amount (equivalent fractions).
- Understand that when multiplying a fraction by any fraction name for 1 you will get an equivalent fraction.
- Demonstrate knowledge of place value when performing the process of division to avoid errors.
- Utilize prior knowledge of multiples to help in the division process.
- Understand that geometric shapes take up space and this space they occupy is called volume, which is measured in cubic units.
- Demonstrate knowledge of the volume formula (l*w*h)

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?)

- Performance Task 11
- Activities from pages 643, 650-651, 701, and 702
- Reinforcing the Content Standards activity on insert page SOV11a
- Any idea from "What will students be able to do" section

Other Evidence: (quizzes, tasks, academic prompts, homework, observations)

- Daily homework
- Power-up tests
- Cumulative tests
- Performance on daily Power-up activities

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:

Lesson 101 – Tables and Schedules 4.OA.3; 4.NBT.1 & 5; 4.NF.4b – c; 4.MD.1 - 2
Lesson 102 – Tenths and Hundredths, Measuring using a meter stick 4.OA.3; 4.NBT.5; 4.NF.4b – c, 6, 4.MD.1, 4.MD.2
Lesson 103 – Fractions Equal to 1 and Fractions Equal to ½ 4.OA.3; 4.NBT.5; 4.NF.1, 4.NF.2, 4.NF.4b – c & 6; 4.MD.1 - 3
Lesson 104 – Changing Improper Fractions to Whole or Mixed Numbers 4.OA.3; 4.NBT.1 & 5; 4.NF.2, 3b, 4a – c, 6; 4.MD.1 - 3
Lesson 105 – Dividing by 10 4.OA.3; 4.NBT.1 & 5; 4.NF.2 & 3b, 4b – c, 6; 4.MD.1 - 2
Lesson 106 – Evaluating Expressions 4.OA. 3; 4.NBT.1 & 5; 4.NF.2, 3b, 4b – c; 4.MD.3
Lesson 107 – Adding and Subtracting Fractions with Common Denominators 4.OA.3; 4.NBT.1 & 5; 4.NF.2, 3a – d, 4b – c, 6; 4.MD.4
Lesson 108 – Formulas and Distributive Property 4.OA.3; 4.NBT.1 – 5; 4.NF2, 3b – d, 4b – c; 4.MD.1 - 3
Lesson 109 – Equivalent Fractions 4.OA.3; 4.NBT.1; 4.NF.1, 4.NF.2, 3a – d, 4b - c
Lesson 110 – Dividing by Multiples of 10 4.OA.3; 4.NF.3b – d, 4b – c; 4.MD.1 - 3
Investigation 11 – Volume, Perimeter, Area 4.MD.2

*It was discussed that the "fact" section of the daily Power-Ups be done on Tuesday/Thursday and the "mental math" section be done on Monday, Wednesday, and Friday. Teacher may also want to cut back on "Written

Practice", possibly only 15 problems each day or having 1 assignment every 2 lessons. This will free up some time for higher level discussion of concepts and Performance Tasks.*

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	