WGSD Curriculum – Math 3rd Grade

In Grade 3, instructional time will focus on four critical areas: (1) developing understanding of multiplication and division and strategies for multiplication and division within 100; (2) developing understanding of fractions, especially unit fractions (fractions with numerator 1); (3) developing understanding of the structure of rectangular arrays and of area and (4) describing and analyzing two-dimensional shapes.

While the content learning goals describe the mathematics students should be able to understand and do, the first eight learning goals (The Standards for Mathematical Practice) describe how students should engage with these mathematical concepts and skills as they grow in mathematical maturity and expertise. Teachers will connect the mathematical practices to mathematical content in all mathematics instruction. These learning goals merit the most time, resources, innovation, and focus necessary to qualitatively improve the instruction, assessment, and student achievement in mathematics.

Students will be able to make sense of problems and persevere in solving them.

Students will be able to reason abstractly and quantitatively.

Students will be able to construct viable arguments and critique the reasoning of others.

Students will be able to model with mathematics.

Students will be able to use appropriate tools strategically.

Students will be able to attend to precision.

Students will be able to look for and make use of structure.

Students will be able to look for and express regularity in repeated reasoning.

Students will be able to represent and solve problems involving multiplication and division.

Students will understand properties of multiplication and the relationship between multiplication and division.

Students will be able to multiply and divide within 100.

Students will be able to solve problems involving the four operations and identify and explain patterns in arithmetic.

Students will use place value understanding and properties of operations to perform multi-digit arithmetic using a range of strategies.

Students will understand fractions as numbers.

Students will be able to solve problems involving measurement and estimation.

Students will understand concepts of area and relate area to multiplication and to addition.

Students will be able to solve problems involving the perimeter of polygons.

Students will be able to reason with shapes and their attributes.

Students will be able to represent and interpret data.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP1

Learning Goal	**Proficiency Scale**
Students will be able to make sense of problems and persevere in solving them.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by: ● Discussing and explaining problems. ● Developing plans to solve problems in multiple ways. ● Struggling with various problem solving attempts over time. ● Learning from previous solution attempts. ● Double checking his/her answers to problems. Approaching: Student demonstrates they are nearing proficiency by performing processes such as: ● Explaining his/her thought processes when solving a problem. ● Representing solutions in several ways. ● Trying several approaches to solve a problem with teacher support. Beginning: Student demonstrates a limited understanding or skill with the learning goal by: ● Explaining his/her thought processes when solving a problem one way. ● Staying with a challenging problem for more than one attempt with prompting.

Learning Targets

- Explain the meaning of a problem and look for ways to solve it
- Use concrete objects or pictures to help conceptualize and solve problems
- Checks their thinking by asking themselves, “Does this make sense?”
- Listens to the strategies of others and tries different approaches
- Uses a different strategy to check answers
- Takes time to thoughtfully consider problems

Learning Design

- Provides time and facilitates discussion in problem solutions.
- Facilitates discourse in the classroom so that students UNDERSTAND the approaches of others.
- Provides opportunities for students to explain themselves, the meaning of a problem, etc.
- Provides opportunities for students to connect concepts to “their” world.
- Provides students TIME to think and become “patient” problem solvers.
- Facilitates and encourages students to check their answers using different methods (not calculators).
- Provides problems that focus on relationships and are “generalizable”.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP2

Learning Goal	**Proficiency Scale**
Students will be able to reason abstractly and quantitatively.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by: ● Converting situations into symbols to solve problems. ● Converting mathematical equations into meaningful situations. Approaching: Student demonstrates they are nearing proficiency by performing a process such as translating situations into symbols to solve problems. Beginning: Student demonstrates a limited understanding or skill with the learning goal by reasoning with models or pictorial representations to solve problems.

Learning Targets

- Recognize that a number represents a specific quantity
- Connect the quantity to written symbols and create a logical representation of the problem at hand
- Consider both the appropriate units involved and the meaning of quantities

Learning Design

- Provides a range of representations of math problem situations and encourages various solutions.
- Provides opportunities for students to make sense of quantities and their relationships in problem situations.
- Provides problems that require flexible use of properties of operations and objects.
- Emphasizes quantitative reasoning which entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, **not just how to compute them and/or rules**; and knowing and flexibly using different properties of operations and objects.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP3

Learning Goal	**Proficiency Scale**
Students will be able to construct viable arguments and critique the reasoning of others.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by: ● Justifying and explaining, with accurate language and vocabulary, why his/her solution is correct. ● Comparing his/her strategy to other students' strategies, asking questions, and making connections with his/her own thinking. ● Explaining the reasoning of others. Approaching: Student demonstrates they are nearing proficiency by performing processes such as: ● Explaining his/her thinking and the thinking of others with accurate vocabulary. ● Explaining other students' solutions and identifying strengths and weaknesses of the strategy. Beginning: Student demonstrates a limited understanding or skill with the learning goal by: ● Explaining his/her solution. ● Discussing other ideas, approaches, and strategies.

Learning Targets

- Construct arguments using concrete referents, such as objects, pictures, and drawings
- Refine their mathematical communication skills by answering questions like "How do you know?" and "Can you show me another way?"
- Refine their mathematical communication skills by asking others questions like "How do you know?" and "How did you get that?"
- Explain their thinking to others and respond to others' thinking

Learning Design

- Provides **ALL** students opportunities to understand and use stated assumptions, definitions, and previously established results in constructing arguments.
- Provides ample time for students to make conjectures and build a logical progression of statements to explore the truth of their conjectures.
- Provides opportunities for students to construct arguments and critique arguments of peers.
- Facilitates and guides students in recognizing and using counterexamples.
- Encourages and facilitates students justifying their conclusions, communicating, and responding to the arguments of others.
- Asks useful questions to clarify and/or improve students' arguments.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP4

Learning Goal	**Proficiency Scale**
Students will be able to model with mathematics.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by: ● Recognizing math in everyday situations. ● Using a variety of models and symbolic representations to represent the solution to a problem. Approaching: Student demonstrates they are nearing proficiency by performing processes such as: ● Recognizing math in everyday situations, when prompted. ● Using models and symbols to represent a problem. Beginning: Student demonstrates a limited understanding or skill with the learning goal by using models to represent a problem with teacher support.

Learning Targets

- Represents problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, making a chart, list, or graph, creating equations, etc, and use all of these representations as needed
- Connect different representations and explain the connections
- Evaluate solutions in the context of the situation and reflect on whether the results make sense

Learning Design

- Provides problem situations that apply to everyday life.
- Provides rich tasks that focus on conceptual understanding, relationships, etc.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP5

Learning Goal	**Proficiency Scale**
Students will be able to use appropriate tools strategically.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by combining various tools to explore and solve a problem as well as justifying his/her tool selection and problem solution. Approaching: Student demonstrates they are nearing proficiency by performing processes such as selecting from a variety of provided tools the ones that can be used to solve a problem and explaining his/her reasoning for the selection. Beginning: Student demonstrates a limited understanding or skill with the learning goal by using the appropriate tool, when provided, to find a solution.

Learning Targets

- Consider the available tools (including, but not limited to estimation, graph paper, manipulatives, table, list, etc.) when solving a mathematical problem and decide when certain tools might be helpful
    - For example, students may use graph paper to find all the possible rectangles that have a given perimeter. They might compile the possibilities into an organized list or table and determine whether they have all the possible rectangles

Learning Design

- Provides a variety of tools and technology for students to explore to deepen their understanding of math concepts.
- Provides problem solving tasks that require students to consider a variety of tools for solving. (Tools might include pencil/paper, concrete models, manipulatives, ruler, protractor, calculator, spreadsheet, computer algebra system, statistical package, or dynamic geometry software, etc.)

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP6

Learning Goal	**Proficiency Scale**
Students will be able to attend to precision.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by using appropriate symbols, vocabulary, and labeling to communicate effectively and exchange ideas. Approaching: Student demonstrates they are nearing proficiency by performing a process such as incorporating appropriate vocabulary and symbols in most mathematical communications. Beginning: Student demonstrates a limited understanding or skill with the learning goal by communicating his/her reasoning and solution to others, with support.

Learning Targets

- Use clear and precise language in their discussions with others and in their own reasoning
- Specify units of measure and state the meaning of the symbols used
- Report answers that appropriately address the context of a problem

Learning Design

- Facilitates, encourages and expects precision in communication.
- Provides opportunities for students to explain and/or write their reasoning to others.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP7

Learning Goal	**Proficiency Scale**
Students will be able to look for and make use of structure.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by: ● Noticing mathematical expressions as component parts. ● Using mathematical generalizations to identify the most efficient solution to mathematical tasks. Approaching: Student demonstrates they are nearing proficiency by performing processes such as composing and decomposing number situations through observed patterns to simplify solutions. Beginning: Student demonstrates a limited understanding or skill with the learning goal by looking for structure within mathematics to help him/her solve problems efficiently.

Learning Targets

- Look closely to discover a pattern or structure
    - For instance, students use properties (commutative and distributive properties) of operations as strategies to multiply and divide

Learning Design

- Provides opportunities and time for students to explore patterns and relationships to solve problems.
- Provides rich tasks and facilitates pattern seeking and understanding of relationships in numbers rather than following a set of steps and/or procedures.

WGSD Curriculum – Math 3rd Grade
Mathematical Practices

High Priority Standards
CCSS.Math.Practice.MP8

Learning Goal	**Proficiency Scale**
Students will be able to look for and express regularity in repeated reasoning.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: Student demonstrates mastery with the learning goal as evidenced by noticing patterns, making generalizations and predicting patterns. Approaching: Student demonstrates they are nearing proficiency by performing processes such as finding and explaining patterns. Beginning: Student demonstrates a limited understanding or skill with the learning goal by connecting prior knowledge to new situations and noticing patterns with prompting from a teacher or peer.

Learning Targets

- Notice repetitive actions in computation and look for more shortcut methods
    - For example, if students are asked to find the product of 7x8, they might decompose 7 into 5 and 2 and then multiply 5x8 and 2x8 to arrive at 40+16 or 56
- Continually evaluate their work by asking themselves, “Does this make sense?”

Learning Design

- Provides problem situations that allow students to explore regularity and repeated reasoning.
- Provides rich tasks that encourage students to use repeated reasoning to form generalizations and provides opportunities for students to communicate these generalizations.

High Priority Standards

3.RA.A.1 Interpret products of whole numbers.
3.RA.A.2 Interpret quotients of whole numbers.
3.RA.A.3 Describe in words or drawings a problem that illustrates a multiplication or division situation.
3.RA.A.4 Use multiplication and division within 100 to solve problems.
3.RA.A.5 Determine the unknown number in a multiplication or division equation relating three whole numbers.

Learning Goal

Students will be able to represent and solve problems involving multiplication and division.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Selecting the appropriate operation to solve one-step real-world or mathematical problems involving measurement (time, length, area, etc.) quantities of single-digit whole numbers.
- Determining the unknown number in a division equation relating three whole numbers.
- Interpreting the meaning of whole number quotients of whole numbers [a whole number divided by a whole number that equals a whole number].
- Describing in words or drawings a problem that illustrates a multiplication or division situation.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: multiply, divide, product, quotient, equation, multiple, and array.
- Performing processes such as:
    - Using multiplication and division within 100 to solve word problems involving equal groups, arrays and rectangular areas.
    - Interpreting the meaning of multiplication of two whole numbers.
    - Determining the unknown number in a multiplication equation relating three whole numbers.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by representing multiplication and division problems within 100 involving equal groups of objects.

Learning Targets

- Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.
- Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as 56 objects divided into groups with 8 objects each, or as 56 objects divided into 8 equal groups
- Describe in words or drawings a problem that illustrates a multiplication or division situation. For example: Janet had 3 boxes that each held 5 books represents "3 x 5". "2 x 4" could be contextualized as James had 2 boxes with 4 toys in each. Brad has 30 cookies. He creates piles of 5 cookies represents "30 ÷ 5".
- 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
- 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 x ? = 48; ?÷ 3 = 5; 6 x 6 = ?; ? = 5 x 7;? = 24 ÷ 4*

Learning Design

Illustrative Mathematics Units 1, 2, 4, & 8

High Priority Standards

3.RA.B.6 Apply properties of operations as strategies to multiply and divide.

Learning Goal

Students will understand properties of multiplication and the relationship between multiplication and division.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Applying the commutative, associative, and distributive properties of multiplication.*
- Applying the relationship between multiplication and division to solve mathematical problems.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: property, pattern, factor, addition, subtraction, multiplication, division, arithmetic, operation.
- Performing processes such as:
  - Applying the commutative and associative properties of multiplication within the 10 by 10 multiplication table.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by applying the commutative property of multiplication to mathematical problems with one-digit factors.

Learning Targets

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

Learning Design

*Students do not need to use formal terms for these properties; however, the teacher should use the correct mathematical vocabulary in class.

Illustrative Mathematics Units 1, 2, 4, & 8

WGSD Curriculum – Math 3rd Grade
Relationships and Algebraic Thinking

High Priority Standards

3.RA.C.7 Multiply and divide with numbers and results within 100 using strategies such as the relationship between multiplication and division or properties of operations. Know all products of two one-digit numbers.
3.RA.C.8 Demonstrate fluency with products within 100.

Learning Goal

Students will be able to multiply and divide within 100.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Applying relevant strategies to multiply and divide fluently within 100.
- Recognizing division as an unknown factor problem.

Approaching: Student demonstrates they are nearing the learning goal by recalling from memory all products of two one-digit numbers.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by multiplying a one-digit number by 1, 2, 5, and 10.

Learning Targets

- 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

Learning Design

You tube videos for strategies: https://www.youtube.com/playlist?list=PLftMBEZKW0lRT_2_EFWuQkORazouP2R0z
quizlets for strategies: https://quizlet.com/bstockus/folders/multiplication-facts-practice/sets
Multiplication subitizing cards: https://gfletchy.com/2019/03/17/multiplication-subitizing-cards/

Illustrative Mathematics Units 4, 7, & 8
MobyMax Fact Fluency or Amplify Fact Fluency

High Priority Standards

3.RA.D.9 Write and solve two-step problems involving variables using any of the four operations.
3.RA.D.10 Interpret the reasonableness of answers using mental computation and estimation strategies including rounding.
3.RA.E.11 Identify arithmetic patterns and explain the patterns using properties of operations.

Learning Goal

Students will be able to solve problems involving the four operations and identify and explain patterns in arithmetic.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Solving two-step word problems using addition and subtraction within 1000.
- Solving two-step word problems using multiplication and division within 100.
- Representing a two-step word problem using an equation with a letter to represent an unknown quantity.
- Explaining patterns in the multiplication table.
- Identifying the rule of a given input/output table.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: computation, equation, estimation, mental, quantity, reasonableness.
- Performing processes such as:
    - Solving two-step mathematical problems using addition and subtraction within 1000.
    - Identifying a two-step word problem that matches a given equation, which uses a variable for the unknown quantity.
    - Assessing the reasonableness of an answer.
    - Identifying patterns in the addition table.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by representing and solving one-step mathematical or word problems using addition, subtraction, and multiplication within 100.

Learning Targets

- 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
- 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*

Learning Design

Illustrative Mathematics Units 1 & 3

WGSD Curriculum – Math 3rd Grade

Number Sense and Operations in Base Ten

High Priority Standards

3.NBT.A.1 Round whole numbers to the nearest 10 or 100.
3.NBT.A.2 Read, write and identify whole numbers within 100,000 using base ten numerals, number names and expanded form.
3.NBT.A.3 Demonstrate fluency with addition and subtraction within 1000.
3.NBT.A.4 Multiply whole numbers by multiples of 10 in the range 10-90.

Learning Goal

Students will use place value understanding and properties of operations to perform multi-digit arithmetic using a range of strategies.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Adding and subtracting fluently within 1000 using strategies or algorithms based on place value understanding, properties of arithmetic, and/or the relationship between addition and subtraction.
- Reading, writing and identifying whole numbers within 100,000 using base ten numerals, number names and expanded form.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: round, nearest, place value, whole number, algorithm, strategy, operation.
- Performing processes such as:
  - Adding and subtracting within 1000 using strategies and algorithms based on the relationship between addition and subtraction with support.
  - Rounding whole numbers to the nearest 10 or 100.
  - Multiplying one-digit whole numbers by multiples of 10 in the range of 10-90.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by:

- Adding and subtracting within 100 using strategies and algorithms based on place value understanding.
- Rounding two-digit whole numbers to the nearest 10.

Learning Targets

- Use place value understanding to round whole numbers to the nearest 10 or 100
- 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
- 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

Learning Design

https://teacher.desmos.com/activitybuilder/custom/5c0839a31d40ba0c79fb933e

Illustrative Mathematics Units 3, 4, & 8

WGSD Curriculum – Math 3rd Grade
Number Sense and Operations in Fractions

High Priority Standards

3.NF.A.1 Understand a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts.
3.NF.A.2 Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole. a. Describe the numerator as representing the number of pieces being considered. b. Describe the denominator as the number of pieces that make the whole.
3.NF.A.3 Represent fractions on a number line. a. Understand the whole is the interval from 0 to 1. b. Understand the whole is partitioned into equal parts. c. Understand a fraction represents the endpoint of the length a given number of partitions from 0.
3.NF.A.4 Demonstrate that two fractions are equivalent if they are the same size, or the same point on a number line.
3.NF.A.5 Recognize and generate equivalent fractions using visual models, and justify why the fractions are equivalent.
3.NF.A.6 Compare two fractions with the same numerator or denominator using the symbols >, = or <, and justify the solution.
3.NF.A.7 Explain why fraction comparisons are only valid when the two fractions refer to the same whole.

Learning Goal

Students will understand fractions as numbers.
(limited to fractions with denominators 2, 3, 4, 6, 8)

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Understanding a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts.
- Representing a fraction on a number line with partitioning.
- Generating simple equivalent fractions and recognizing when they are equal to whole numbers.
- Comparing two fractions with the same numerator or the same denominator by reasoning about their size.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: fraction, equal, number line, part, size, whole, equivalent, numerator, denominator, compare.
- Performing processes such as:
    - Understanding that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole.
    - Identifying a fraction on a number line partitioned into equal parts.
    - Describing the numerator as representing the number of pieces being considered and the denominator as the number of pieces that make the whole.
    - Recognizing simple equivalent fractions.
    - Expressing whole numbers as fractions.
    - Recognizing that comparisons are valid only when the two fractions refer to the same whole.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by:

- Identifying a fraction as a number.
- Identifying a fraction on a number line when the increments are equal to the denominator.

Learning Targets

- Understand a unit fraction as the quantity formed by one part when a whole is partitioned into equal parts. (For example, ¼ [1 fourth] represents 1 of the 4 equal parts or ¼ of the whole.)

- Understand that when a whole is partitioned equally, a fraction can be used to represent a portion of the whole.
    - The numerator of the fraction represents the number of pieces being considered.
    - The denominator is the number of pieces that make the whole. (For example, ¾ [3 fourths] represents 3 pieces that are each ¼ of the whole.)

- Understand a fraction as a number on the number line; represent fractions on a number line diagram.
    - Understand the whole is the interval from 0 to 1.
    - Understand the whole is partitioned into equal parts.
    - Understand a fraction represents the endpoint of the length a given number of partitions from 0. (For example, ¾ is located at the end of the length that is 3 partitions from 0 when each partition is a fourth.)

- Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size
    - Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line
    - 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
    - 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 on a number line diagram*
    - Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions by using number lines, manipulative or drawings.

Learning Design

Illustrative Mathematics Units 5 & 8

WGSD Curriculum – Math 3rd Grade

Geometry & Measurement

High Priority Standards

3.GM.B.4 Tell and write time to the nearest minute.
3.GM.B.5 Estimate time intervals in minutes.
3.GM.B.6 Solve problems involving addition and subtraction of minutes.
3.GM.B.7 Measure or estimate length, liquid volume and weight of objects.
3.GM.B.8 Use the four operations to solve problems involving lengths, liquid volumes or weights given in the same units.

Learning Goal	**Proficiency Scale**
Students will be able to solve problems involving measurement and estimation.	Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal. Meeting: In addition to score 2 performance, student demonstrates mastery with the learning goal as evidenced by: ● Solving one-step word problems involving addition and subtraction of minutes. ● Multiplying or dividing to solve problems involving lengths, liquid volumes or weights given in the same units. ● Estimating the length, liquid volume and weight of given objects. Approaching: Student demonstrates they are nearing the learning goal by: ● Recognizing and recalling specific vocabulary, such as: elapsed time, minute, time interval, estimate, gram, kilogram, liquid, liter, mass, measure, unit, volume. ● Performing processes such as: ○ Telling and writing time to the nearest minute. ○ Estimating elapsed time for a particular situation. ○ Solving problems involving time intervals in minutes. ○ Measuring the length, liquid volume and weight of given objects. ○ Adding or subtracting to solve problems involving lengths, liquid volumes or weights given in the same units. Beginning: Student demonstrates a limited understanding or skill with the learning goal by: ● Telling and writing time to the nearest five minute interval.

Learning Targets

- Tell and write time to the nearest minute and measure time intervals in minutes. Estimate time intervals in minutes. (e.g., will it take more than 5 minutes or less than 5 minutes to read 5 chapters of a book)
- The expectation of the student is to solve one-step word problems involving addition and subtraction of minutes using number lines, clock faces or other strategies. (e.g. James left home at 1:20 and rode his bike for 30 minutes. What time did he stop riding? It took Gerry 25 minutes to walk to school. If he arrived at 8:40, what time did he leave home?)
- Use the four operations to solve problems involving lengths (no smaller than the nearest centimeter or ¼ inch), liquid volume or weights given in the same units.
- Estimate and measure the length (no smaller than the nearest centimeter or ¼ inch), liquid volume and weight of given objects.

Learning Design

Illustrative Mathematics Unit 6

High Priority Standards

3.GM.C.9 Calculate area by using unit squares to cover a plane figure with no gaps or overlaps.
3.GM.C.10 Label area measurements with squared units.
3.GM.C.11 Demonstrate that tiling a rectangle to find the area and multiplying the side lengths result in the same value.
3.GM.C.12 Multiply whole-number side lengths to solve problems involving the area of rectangles.
3.GM.C.13 Find rectangular arrangements that can be formed for a given area.
3.GM.C.14 Decompose a rectangle into smaller rectangles to find the area of the original rectangle.

Learning Goal

Students will understand concepts of area and relate area to multiplication and to addition.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Calculating the area of a rectangle by multiplying side lengths.
- Solving problems involving the areas of rectangles.
- Calculating the area of polygons with all right angles by decomposing into non-overlapping rectangles and adding them together.
- Creating rectangular arrangements that can be formed for a given area.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: area, calculate, decompose, figure, length, measure, measurement, overlap, rectangular, side, square unit, tiling.
- Performing a process such as calculating the area of a polygon with all right angles by counting unit squares.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by:

- Recognizing area as an attribute of plane figures.
- Recognizing that a square with side lengths of one unit is called a unit square.
- Using square units to label area measurements.

Learning Targets

- Calculate area by using unit squares to cover a plane figure with no gaps or overlaps.
- Multiply side lengths to find areas of rectangles with whole-number side lengths and solve problems involving the area of rectangles.
- Demonstrate that tiling a rectangle to find the area and multiplying the side lengths result in the same value.
- Find rectangular arrangements that can be formed for a given area. (e.g., an area of 12 sq. cm can be shown as a 3 x 4 rectangle, a 2 x 6 rectangle or a 1 x 12 rectangle)
- Decompose a rectangle into two smaller rectangles, find the area of each smaller rectangle, and combine the areas to find the area of the original rectangle (Note: This is an application of the distributive property.) (e.g., a 16 x 5 rectangle could be divided into a 10 x 5 rectangle and a 6 x 5 rectangle) The area of the original rectangle can be found by adding 50 + 30.
- Recognize area as an attribute of plane figures and understand concepts of area measurement. 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.
- Use square units to label area measurements. (e.g.,square cm. or sq. cm or cm^2)
- Relate area to the operations of multiplication and addition

Learning Design

Illustrative Mathematics Units 2, 4, & 8

High Priority Standards

3.GM.D.15 Solve problems involving perimeters of polygons.
3.GM.D.16 Understand that rectangles can have equal perimeters but different areas, or rectangles can have equal areas but different perimeters.

Learning Goal

Students will be able to solve problems involving the perimeter of polygons.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by identifying rectangles with the same perimeter and different areas or with the same area and different perimeters.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: perimeter, polygon, length, area.
- Performing processes such as solving for an unknown side length of a polygon when given the perimeter in mathematical and real-world problems.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by finding the perimeter of polygons given all side lengths in real-world and mathematical problems.

Learning Targets

- Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters

Learning Design

Illustrative Mathematics Units 7 & 8

WGSD Curriculum – Math 3rd Grade
Geometry & Measurement

High Priority Standards

3.GM.A.1 Understand that shapes in different categories may share attributes and that the shared attributes can define a larger category.
3.GM.A.2 Distinguish rhombuses and rectangles as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to these subcategories.
3.GM.A.3 Partition shapes into parts with equal areas, and express the area of each part as a unit fraction of the whole.

Learning Goal

Students will be able to reason with shapes and their attributes.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Drawing examples of quadrilaterals that do not belong to given subcategories by reasoning about their attributes.
- Partitioning shapes into parts with equal areas and express the area of each part as a unit fraction of the whole.
- Identifying that shapes in different categories may share attributes and that the shared attributes can define a larger category.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: attribute, classify, quadrilateral, rhombus, rectangle, square, area, partition, unit fraction, whole.
- Performing processes such as:
    - Reasoning with the attributes of quadrilaterals to recognize rhombuses, rectangles, and squares as examples of quadrilaterals.
    - Reasoning with shapes to partition them into parts with equal areas.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by recognizing rhombuses, rectangles, and squares.

Learning Targets

- 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
- Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole
    - *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape*

Learning Design

Illustrative Mathematics Units 7 & 8

WGSD Curriculum – Math 3rd Grade
Data & Statistics

High Priority Standards

3.DS.A.1 Create frequency tables, scaled picture graphs and bar graphs to represent a data set with several categories.
3.DS.A.2 Solve one- and two-step problems using information presented in bar and/or picture graphs.
3.DS.A.3 Create a line plot to represent data.
3.DS.A.4 Use data shown in a line plot to answer questions.

Learning Goal

Students will be able to represent and interpret data.

Proficiency Scale

Innovating: Student demonstrates an in-depth inference or advanced application, or innovates with the learning goal.

Meeting: Student demonstrates mastery with the learning goal as evidenced by:

- Creating a frequency table, scaled picture graph and a scaled bar graph to represent a data set.
- Solving two-step "How many more?" and "How many less?" problems using information presented in bar and/or picture graphs.
- Creating a line plot with a horizontal scale marked in quarter-unit intervals.
- Using the data shown in a line plot to generate a set of observations about the data and to answer questions about the data.

Approaching: Student demonstrates they are nearing the learning goal by:

- Recognizing and recalling specific vocabulary, such as: frequency table, bar graph, data, data set, half, fourth, inch, line plot, picture graph, scaled, intervals.
- Performing processes such as:
    - Representing data on a line plot with a horizontal scale marked in half-unit intervals.

Beginning: Student demonstrates a limited understanding or skill with the learning goal by:

- Drawing a picture graph and a bar graph to represent a data set with up to four categories.
- Solving one-step "How many more?" and "How many less?" problems using information presented in bar and/or picture graphs.
- Creating a line plot to represent a data set with a horizontal scale marked in whole unit intervals.

Learning Targets

- Create frequency tables, picture graphs and/or bar graphs to represent a given data set with several categories. Include picture graphs in which the symbol used represents more than 1 and bar graphs with the scale marked in intervals greater than 1.
- 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*
- 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
- Use the data shown in a line plot to generate a set of observations about the data and to answer questions about the data. (e.g.,What do you notice about the data we collected? Why didn't we all get the same length when we measured our desks? What's the difference in length between the shortest and longest pencil (if data is reported to the nearest whole number)? How many students have a pencil longer than 10 cm? What pencil length is most common?) (Formal terms such as 'mode', 'range' or 'maximum' are not required at this grade level.)

Learning Design

Illustrative Mathematics Units 1, 6, & 8

Sources:

https://dese.mo.gov/sites/default/files/curr-mls-standards-math-k-5-sboe-2016.pdf

https://dese.mo.gov/sites/default/files/curr-math-mls%20expanded-expectaions-grade-3.pdf

http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/11/Smarter-Balanced-Math-ALDs.pdf

http://www.corestandards.org/Math

http://itembank.marzanoresearch.com/search_details.aspx

http://www.mathleadership.com/sitebuildercontent/sitebuilderfiles/standardsoftudentpracticeinmathematicsproficiencymatrix.pdf

Standards for Mathematical Practices Observation Tool created by Melisa Hancock for KATM/KSDE CCSS Summer Academy 2011