Lavallette Elementary School	
Content Area: Mathematics **Course Title: Mathematics**	**Grade Level: Fourth Grade**
Unit Plan 1 Operations and Algebraic Thinking	September - October Ongoing
Unit Plan 2 Number and Operations in Base 10	November - January Ongoing
Unit Plan 3 Number and Operations - Fractions	January - February Ongoing
Unit Plan 4 Measurement and Data	March - April Ongoing
Unit Plan 5 Geometry	April - June Ongoing
Updated: August 2018 by Sharon Carroll	Board Approved: October 16, 2018

Standards for Mathematical Practice *The following standards for mathematical practice should be incorporated in all units.*	
MP.1 Make sense of problems and persevere in solving them.	Find meaning in problems Look for entry points Analyze, conjecture and plan solution pathways Monitor and adjust Verify answers Ask themselves the question: “Does this make sense?”

MP.2 Reason abstractly and quantitatively.	Make sense of quantities and their relationships in problems Learn to contextualize and decontextualize Create coherent representations of problems
MP.3 Construct viable arguments and critique the reasoning of others.	Understand and use information to construct arguments Make and explore the truth of conjectures Recognize and use counterexamples Justify conclusions and respond to arguments of others
MP 4 Model with mathematics.	Apply mathematics to problems in everyday life Make assumptions and approximations Identify quantities in a practical situation Interpret results in the context of the situation and reflect on whether results make sense
MP.5 Use appropriate tools strategically	Consider the available tools when solving problems Are familiar with tools appropriate for their grade or course (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer programs, digital content located on a website and other technological tools) Make sound decisions of which of these tools might be helpful
MP.6 Attend to precision.	Communicate precisely to others Use clear definitions, state the meaning of symbols and are careful specifying units of measure and labeling axes Calculate accurately and efficiently
MP.7 Look for and make use of structure	Discern patterns and structures Can step back for an overview and shift perspective See complicated things as single objects or as being composed of several objects
MP.8 Look for and express regularity in repeated reasoning.	Notice if calculations are repeated and look for both general methods and shortcuts. In solving problems, maintain oversight of the process while attending to detail Evaluate the reasonableness of their immediate results

Lavallette School
MATHEMATICS CURRICULUM
Unit Overview

Content Area: Mathematics **Grade Level:** Fourth Grade

Domain (Unit Title): Operations and Algebraic Thinking

Cluster: 4.OA

Cluster Summary:

- Use the four operations with whole numbers to solve problems
- Gain familiarity with factors and multiples
- Generate and analyze patterns

Primary Interdisciplinary Connections:

Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to **Energy, Earth and Human Activity** and **Engineering and Design.**
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature
Technology	8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication and Collaboration	Students will use mathematical arguments to articulate thoughts and ideas with peers and teachers.

College and Career Readiness

Mathematics programs develops a deep understanding of mathematics by building a strong foundation of number sense at the elementary level before moving into more advanced content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

Learning Targets

Content Standards: OA

Number	Standard for Mastery
4.OA.1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
4.OA.2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.
4.OA.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.OA.4	Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

4.OA.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.
Number	**Standard for Introduction**
5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

Unit Essential Questions	**Unit Enduring Understandings** *Students will understand that…*
● How can fractions and decimals be modeled, compared, and ordered? ● How are common fractions and decimals alike and different? ● How is computation with rational numbers similar and different to whole number computation?	● fractions and decimals express a relationship between two numbers. ● fractions and decimals are parts of whole numbers. ● an improper fraction represents a number greater than one and can be expressed as a mixed number.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● how to make a visual representation of a fraction or decimal. ● how to make computations with fractions.	● understand fractions as division of two whole numbers. ● read and write symbolic notation for fractions. ● identify fractions as part of a whole, part of a set, part of an area, and locations on the number line. ● recognize and name equivalent fractions. ● order fractions, including improper fractions, and mixed numbers.

Lavallette School
MATHEMATICS CURRICULUM
Unit Overview

Content Area: Mathematics **Grade Level:** Fourth Grade

Domain (Unit Title): Number and Operations in Base 10

Cluster: 4.NBT

Cluster Summary:

- Generalize place value understanding for multi-digit whole numbers
- Use place value understanding and properties of operations to perform multi-digit arithmetic

Primary Interdisciplinary Connections:

Science	measurement (distance, weight, and growth), data analysis and collection
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature
Technology	8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps

21st Century Themes:

Global Awareness	Students work with word problems containing names of people

	and locations around the world.
Communication and Collaboration	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Critical Thinking and Problem Solving	Students use various types of reasoning as appropriate to solve a mathematical problem.

College and Career Readiness

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Learning Targets

Content Standards: NBT

Number	Standard for Mastery
4.NBT.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. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm
4.NBT.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.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Number	**Standard for Introduction**
5.NBT.3	Read, write and compare decimals to the thousandths.

Unit Essential Questions	**Unit Enduring Understandings**
● How can place value properties aid computation? ● How can numbers be expressed, ordered, and compared? ● What are strategies to make a reasonable estimate? ● How do I know when an answer is reasonable? ● What makes a strategy for computing effective and efficient?	*Students will understand that…* ● place value is based on groups of ten. ● numbers will represent quantity, position, location, and relationships. ● estimation is a way to get an approximate answer. ● computation involves taking apart and combining numbers using a variety of approaches.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● to identify place value positions while calculating the 4 operations ● to identify place value of a given number to make comparisons. ● to estimate to justify the reasonableness of their answer.	● add, subtract, multiply and divide whole numbers. ● apply place value to whole numbers. ● compare, order, and express whole numbers using base ten numerals, number names and expanded form. ● round numbers to check their accuracy.

Lavallette School
MATHEMATICS CURRICULUM
Unit Overview

Content Area: Mathematics **Grade Level:** Fourth Grade

Domain (Unit Title): Number and Operations - Fractions

Cluster: 4.NF

Cluster Summary:

- Extend understanding of fraction equivalence and ordering
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers
- Understand decimal notation for fractions, and compare decimal fractions

Primary Interdisciplinary Connections:

Science	measurement (distance, weight, and growth), data analysis and collection
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature
Technology	8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of

	diverse cultures and lifestyles.
Communication and Collaboration	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Civic Literacy	Students understand the skills of mapping, gridding, compass directions, and cardinal directions

College and Career Readiness

Mathematics programs develops a deep understanding of mathematics by building a strong foundation of number sense at the elementary level before moving into more advanced content. Students will learn to make sense of problems and persevere in problem solving, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, attend to precision, look for and make use of a structure, and look for and express regularity in repeated reasoning.

Learning Targets

Content Standards: NF

Number	Standard for Mastery
4.NF.1	Explain why a fraction *a*/*b* is equivalent to a fraction (n x a)/(n x 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.
4.NF.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.
4.NF.3	Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*.
4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with

	respective denominators 10 and 100. *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*
4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

Unit Essential Questions	**Unit Enduring Understandings**
How can fractions and decimals be modeled, compared, and ordered? How are common fractions and decimals alike and different? How is computation with rational numbers similar and different to whole number computation?	*Students will understand that…* ● fractions represent equal parts of a whole unit ● fractions are represented on a number line ● fractions with different numerators and denominators can be compared by reasoning about their size

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● fractions represent equal parts of a whole unit. ● fractions are represented on a number line. ● fractions can still be equivalent even though they appear to be different	● construct a fraction based on an object partitioned into equal parts. ● compare fractions by using visual fraction models and number lines to understand equivalent fractions. ● compare two fractions with the same numerator or the same denominator by reasoning about their size.

Lavallette School
MATHEMATICS CURRICULUM
Unit Overview

Content Area: Mathematics **Grade Level:** Fourth Grade

Domain (Unit Title): Measurement and Data

Cluster: 4.MD

Cluster Summary:

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit
- Represent and interpret data
- Geometric measurement: understand concepts of angle and measure angles

Primary Interdisciplinary Connections:

Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to **Waves**, **Earth's Place in the Universe** and **Earth's Systems.**
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature
Technology	8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps

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Learning Targets

Content Standards: MD

Number	Standard for Mastery
4.MD.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
4.MD.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.
4.MD.3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
4.MD.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. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called "one-degree angle" and can be used to measure angles. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.
Number	**Standard for Introduction**
5.MD.3	Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube" is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said is said to have a volume of *n* cubic units
5.MD.4	Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
5.MD.5	Relate volume to the operations of multiplication and addition and solve real world mathematical problems involving volume.

Unit Essential Questions	**Unit Enduring Understandings** *Students will understand that…*
● What types of problems are solved with measurement? ● What are the tools of measurement	● objects have distinct attributes that can be measured. ● standard units provide common

and how are they used? ● How do units within a system relate to each other? ● When is an estimate more appropriate than an actual measurement? ● How can information be gathered, recorded, and organized? ● What visual aspects of a data display help people understand and interpret information easily?	language for communication of measurements. ● the choice of measurement tools depends on the measurable attribute and the degree of precision desired. ● data displays convey information in a concise way.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● how to tell time. ● how to measure angles using a protractor. ● how to use and read a variety of measurement tools, such as thermometers, rulers, tape measures, and scales, etc. ● how to create and analyze tables and line plots to record data.	● calculate elapsed time in word problems. ● describe temperature with thermometers. ● determine length/height with rulers and measuring tapes. ● measure weight with variety of scales. ● find area of rectangles using formula. ● calculate perimeter of polygons. ● record with customary and metric units. ● communicate measurements. ● understand the relationships between and among units. ● carry out conversions with units of time and money. ● carry out conversions of customary and metric units of length, weight and volume.

Lavallette School
MATHEMATICS CURRICULUM
Unit Overview

Content Area: Mathematics **Grade Level:** Fourth Grade

Domain (Unit Title): Geometry

Cluster: 4.G

Cluster Summary:

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles

Primary Interdisciplinary Connections:

Science	measurement (distance, weight, and growth), data analysis and collection, experiments relating to **Molecules to Organisms.**
Social Studies	economics & money, weather patterns, geography & map skills, and graphing
Language Arts	math journals, word problem comprehension, math stories, open-ended math questions, multi-step problems, math literature
Technology	8.1- Educational Technology: use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge. interactive whiteboard lessons, independent centers, classroom websites, online resources and apps

21st Century Themes:

Global Awareness	Students work with word problems containing names of people and locations around the world to develop understanding of diverse cultures and lifestyles.
Communication	Students use mathematical arguments to articulate thoughts and ideas with peers and teachers
Civic Literacy	Students understand the skills of mapping, gridding, and compass directions

College and Career Readiness

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Learning Targets

Content Standards: G

Number	Standard for Mastery
4.G.1	Draw points, lines, line segments, ray, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specific size. Recognize right triangles as a category, and identify right triangles.
4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetrical figures and draw line of symmetry.

Unit Essential Questions	**Unit Enduring Understandings**
● How can understanding geometric vocabulary assist with drawing points, lines, line	*Students will understand that…* ● geometry offers ways to interpret and compare real-world objects. ● analyzing geometric relationships

segments, rays, and angles? ● How do geometric relationships help us solve problems? ● How are geometric shapes and objects classified?	develops reasoning and justification skills.

Unit Objectives *Students will know…*	**Unit Objectives** *Students will be able to…*
● how to draw and classify points, lines, line segments, rays, and angles with the appropriate tools. ● the difference between parallel and perpendicular lines. ● how to identify symmetry in a two-dimensional shape	● draw and classify points, lines, line segments, rays, and angles with appropriate tools. ● identify that two lines are perpendicular when they intersect in right angles. ● identify and describe symmetry in two-dimensional geometric shapes. ● identify two-dimensional geometric shapes based on their properties.

Evidence of Learning

Suggested Formative Assessments:

- Teacher Observation
- Performance Assessment
- Exit Slips/Slate Assessment
- Portfolios/Journals
- Pre-Assessment
- · Games
- · Anecdotal Records
- · Oral Assessment/Conferencing
- · Daily Classwork

Suggested Summative Assessments:

- Tests
- Quizzes
- National/State/District Assessments

Suggested Modifications (ELLs, Special Education, Gifted and Talented):

Low Level Strategies:

- Modified classroom and homework assignments
- Teacher tutoring
- Parent - teacher communication

- Anchor charts and visual aids
- Flexible grouping
- Teacher - student goal setting
- Technology integration
- Centers
- Response to intervention

High Level Strategies

- Multi-step and higher level math problems
- Enrich problems
- Extend activities
- Centers
- Student driven activities
- Student choice activities
- Peer tutoring

Suggested activities for lesson plans:

Math Literature:

Specific Books for Geometry:

The Greedy Triangle by Marilyn Burns

The Dot and the Line by Norton Juster

Spaghetti and Meatballs by Marilyn Burns

Grandfather Tang's Story by Ann Tampert

Websites:

www.tenmarks.com

www.mathisfun.com

www.sumdog.com

www.multiplication.com

www.mathgametime.com

www.mrnussbaum.com

www.interactivesites.weebly.com

IPAD games:

4th Grade Splash Math

K-5 Fun Learning Splash Math Games

Turbo Math Pirate Challenge

Doodle Math

4th Grade Planet
Teacher Notes: