GOMath!

Grade 4

Curriculum

Lower Township Elementary Schools
2015

Course Description:

Grade 4 GOMath!

Course Description:

In Grade 4, instructional time should focus on three critical areas: developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends; developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators,and multiplication of fractions by whole numbers; understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate,and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Course Goals:

A. Operations and Algebraic Thinking – 4.OA
- Use the four operations with whole numbers to solve problems.
- Gain familiarity with factors and multiples.
- Generate and analyze patterns.

B. Number and Operations in Base Ten – 4.NBT
- Generalize place value understanding for multidigit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

C. Number and Operations—Fractions – 4.NF
- 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.

D. Measurement and Data – 4.MD
- 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.

E. Geometry – 4.G
- Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Course Enduring Understandings:

Ideas that have lasting value beyond the classroom. Consider, "what do we want students to understand and be able to use several years from now, after they have forgotten the details?"

A. Operations and Algebraic Thinking – 4.OA
- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.

B. Number and Operations in Base Ten – 4.NBT
- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- A quantity can be represented numerically in many ways. Problem solving depends on using the correct way.
- Numeric fluency includes both the understanding of and the ability to appropriately use numbers.

- Computational fluency the appropriate use of numerical operations.
- In many cases, there are multiple algorithms for finding a mathematical solution.
- When using estimation, the context is very important.

C. Number and Operations—Fractions – 4.NF
- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- One representation may sometimes be more helpful than another; and used together multiple representatives give a fuller understanding of a problem.
- In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.

D. Measurement and Data – 4.MD
- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways.
- Phenomena can be described and compared using measurement.

E. Geometry – 4.G
- Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.
- Geometric relationships create pathways to understanding a variety of phenomena.

Common Core State Standards:

Grade 4 Overview

Operations and Algebraic Thinking

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

Number and Operations in Base Ten

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

Number and Operations—Fractions

- 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.

Measurement and Data

- 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.

Geometry

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

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Operations and Algebraic Thinking 4.OA

Use the four operations with whole numbers to solve problems.

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.
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.[1]
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.

Gain familiarity with factors and multiples.

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.

Generate and analyze patterns.

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 and Operations in Base Ten[2] 4.NBT

Generalize place value understanding for multi-digit whole numbers.

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.*
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.
3. Use place value understanding to round multi-digit whole numbers to any place.

Use place value understanding and properties of operations to perform multi-digit arithmetic.

4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
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.

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 and Operations—Fractions[3] 4.NF

Extend understanding of fraction equivalence and ordering.

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.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

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. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*
    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 $1/b$. *For example, use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4).*
    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. *For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. (In general, n x (a/b) = (n x a)/b.)*
    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. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

Understand decimal notation for fractions, and compare decimal fractions.

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.[4] *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*
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.*
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.

Measurement and Data 4.MD

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

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. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*
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. *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.*

Represent and interpret data.

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.*

Geometric measurement: understand concepts of angle and measure angles.

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 a "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.

21st Century Career Ready Practices:

Career Ready Practices	
1. Act as a responsible and contributing citizen and employee.	**X**
2. Apply appropriate academic and technical skills	**X**
3. Attend to personal health and financial well-being.	**X**
4. Communicate clearly and effectively and with reason.	**X**
5. Consider the environmental, social and economic impacts of decisions	**X**
6. Demonstrate creativity and innovation.	**X**
7. Employ valid and reliable research strategies.	**X**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	**X**
9. Model integrity, ethical leadership and effective management.	**X**
10. Plan education and career paths aligned to personal goals.	**X**
11. Use technology to enhance productivity.	**X**
12. Work productively in teams while using cultural global competence.	**X**

21st Century Life and Careers Standards Addressed/Taught in 4th Grade Math

9.1.4.B.1	Differentiate between financial wants and needs
9.1.4.B.2	Identify age-appropriate financial goals
9.1.4.B.3	Explain what a budget is and why it is important
9.1.4.B.4	Identify common household expense categories and sources of income
9.1.4.B.5	Identify ways to earn and save
9.1.4.C.2	Identify common sources of credit (example: banks, credit card companies) and types of credit (example: loans, credit cards, mortgages)
9.1.4.C.3	Compare and contrast credit cards and debit cards, and the advantages/disadvantages of using each.
9.1.4.D.1	Determine various ways to save.
9.1.4.E.1	Determine factors that influence consumer decision related to money
9.1.4.E.2	Apply comparison shopping skills to purchasing decisions
9.1.8.E.1	Explain what it means to be a responsible consumer and the factors to consider when making consumer decisions.
9.1.4.F.1	Demonstrate an understanding of individual financial obligations, and community financial obligations
9.2.4.A.4	Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Unit Names:

Operations and Algebraic Thinking
Numbers and Operations in Base Ten
Number and Operations - Fractions
Measurement and Data
Geometry

Materials :

Houghton Mifflin-Harcourt GOMath! 2015

Infusion of Technology :

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
- 8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
- 8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
- 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.
- 8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Course Assessments:

Formative Assessments:

Classwork
Homework
Center Work
Observation
Questioning/Discussion

Summative Assessments:

District Unit Assessments
District Alternative Assessments
District Problem Solving Benchmarks
End-of-year Assessment

Content Area:	Mathematics	Grade(s)	4
Unit Plan Title:	Operations and Algebraic Thinking		

Anchor Standard (ELA) or Domain (Math)

Operations and Algebraic Thinking- 4.OA

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

Overview/Rationale

Students develop, discuss, and use efficient, accurate and generalizable methods to compute products of multi-digit whole numbers when applying their understanding of models of multiplication (equal-sized groups, arrays, and area models) and properties of operations, in particular the distributive property. They develop efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on properties of operations; and use them to solve problems. Students develop, discuss, and use efficient, accurate and generalizable procedures to find quotients involving multi-digit dividends when applying their understanding for models of division, properties of operations, and the relationship of division to multiplication.

Standard(s)

- 4.OA.1 Interpret a multiplication equation as a comparison , e.g. interpret 35 = 5 x 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 multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represents these problems using equations with a letter standing for an unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- 4.OA.B.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.C.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.

Technology Standard(s)

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.

- 8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
- 8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
- 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.
- 8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Standards for Mathematical Practice(s)

1. Make sense of problems and persevere in solving problems.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Essential Question(s)

- In what ways can operations affect numbers?
- How can different strategies be helpful when solving a problem?
- Why is a ballpark estimate important?
- Can you describe how a function machine works?
- How does turn around facts help you to know your facts?
- What's the relationship between multiplication and division?
- What are key words to tell us to add, subtract, multiply, or divide in a number story?

Enduring Understandings

- Mathematical operations are used in solving problems in which a new value is produced from one or more values.
- Algebraic thinking involves choosing, combining, and applying effective strategies for answering quantitative questions.

In this unit plan, the following 21st Century Career Ready Practices are addressed.

Career Ready Practices	
1. Act as a responsible and contributing citizen and employee.	**X**
2. Apply appropriate academic and technical skills	**X**
3. Attend to personal health and financial well-being.	**X**
4. Communicate clearly and effectively and with reason.	**X**

5. Consider the environmental, social and economic impacts of decisions	**X**
6. Demonstrate creativity and innovation.	**X**
7. Employ valid and reliable research strategies.	**X**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	**X**
9. Model integrity, ethical leadership and effective management.	**X**
10. Plan education and career paths aligned to personal goals.	**X**
11. Use technology to enhance productivity.	**X**
12. Work productively in teams while using cultural global competence.	**X**

Student Learning Targets/Objectives

- Use the four operations with whole numbers by
  - Explaining how a multiplication equation can be interpreted as a comparison
  - Writing an equation for a situation involving multiplicative inverse
  - Distinguishing between multiplicative and additive comparisons
  - Determining when to multiply or divide in word problems
  - Solving a multiplication or division word problems involving multiplicative comparisons using drawings and equations
  - Writing an equation using a variable to represent the unknown
  - Choosing the correct operation to perform at each step of a multi-step word problem
  - Interpreting remainders in a word problem
  - Writing equations using a variable to represent the unknown
  - Using mental math to estimation strategies to check if my answer is reasonable
- Gain familiarity with factors and multiples by
  - Defining factors and multiples
  - Listing all of the factor pairs for any whole number in the range 1-100
  - Determining multiples of a given whole number
  - Defining prime and composite numbers
  - Determining if a number is prime or composite
- Generate and analyze patterns by
  - Generating a pattern that follows a given rule
  - Identifying and explaining additional patterns or special behaviors in a pattern that go beyond the given rule

Assessments

- **Pre and Formative** –
  - Problem Solving Benchmarks
  - Facts Benchmarks
  - Share and Show

- Discussion/Questioning
- Teacher Observationp

- **Summative - Other assessment measures**
  - Chapter Tests

- **Other Assessment Measures- Alternate Assessments**
  - Personal Math Trainer
  - Online digital assessments

Teaching and Learning Actions	
Instructional Strategies Differentiation	**Instructional Strategies** - Breaking down the task - Providing step-by-step prompts - Daily testing - Repeated practice - Sequenced Review - Directed Questioning and Responses - Sequence Tasks from Easy to Difficult - Individual/Small-Group/Whole Class Instruction - Think Aloud - Peer Tutoring - Active Participation - Warm-Up Activities - Meaningful Real Life Connections - Modeling - Teachers demonstrates, student uses models to problem solve - Centers - Manipulatives – Concrete Experiences - Goal Setting - Mental Math - Pencil & Paper Skills - Calculator Use/Technology - Make Predictions/Estimation - Writing Explanations - Scaffolding - Extended Form - Partial Sums/Carrying - Trade First - Borrowing - Draw a Picture - Guess and Check - Working Backwards - Multistep - Calculator Use/Technology - Graphic Organizers
Activities Differentiation	- Leftovers - Addition Top-It - Subtraction Top-It - Product Pile-Up

	- Name That Number - Buzz and Bizz-Buzz - Prime Number Hunt - Baseball Multiplication - Multiplication Top-It - Beat the Calculator - Divisions Array - Estimating Cost of a Purchase - Finding Totals and Making Change - Multiplication Wrestling - Solving Venn Diagram Puzzles - Using Number Lines to Find the Halfway Point - Division Dash - Performing a Magic Trick - Credits/Debits - Personal Math Trainer (Online)
Resources	

4.OA.1

GOMath! Grade 4:

- Lessons: 2.1

4.OA.2

GOMath! Grade 4:

- Lessons: 2.2, 4.12

4.OA.3

GOMath! Grade 4:

- Lessons: 2.9, 2.12, 3.7, 4.3, 4.12

4.OA.B.4

GOMath! Grade 4:

- Lessons: 5.1, 5.2, 5.3, 5.4, 5.5

4.OA.C.5

GOMath! Grade 4:

- Lessons: 5.6, 10.7

Suggested Time Frame:	By the end of fourth grade

Content Area:	Mathematics	Grade(s)	4
Unit Plan Title:	Number and Operations in Base Ten		

Anchor Standard (ELA) or Domain (Math)

Number and Operations in Base Ten- 4.NBT

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

Overview/Rationale

Students will be able to increase their understanding of place value to 1,000,000 by working with the value of numbers in each place. They apply this understanding of place value by performing the four basic operations with multi-digit numbers. They will be able to pick and correctly use appropriate methods to estimate or mentally calculate products and quotients. They will also interpret any remainders depending on the context.

Standard(s)

- 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 the 700/70 = 10 by applying concepts of place value and division.
- 4.NBT.A.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 >, =, or < symbols to record the results of comparisons.
- 4.NBT.A.3 Use place value understanding to round multi-digit whole numbers to any place.
- 4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.
- 4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number , and multiply two two-digits 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.B.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.

Technology Standard(s)

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
- 8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
- 8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
- 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.

- 8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Standards for Mathematical Practice(s)

1. Make sense of problems and persevere in solving problems.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Essential Question(s)

- How does a digit's position affect its value?
- How will place value help you in everyday counting?
- How can we compare and contrast numbers?
- How can counting, measuring, or labeling help to make sense of the world around us?
- How do operations affect numbers?
- How can we decide to use an exact answer and when to use an estimate?
- What makes a computational strategy both effective and efficient?
- How do mathematical representations reflect the needs of society across cultures?

Enduring Understandings

- Understanding place value can lead to number sense and efficient strategies for computing with numbers.
- A quantity can be represented numerically in many ways. Problem solving depends on using the correct way.
- Numeric fluency includes both the understanding of and the ability to appropriately use numbers.
- Computational fluency the appropriate use of numerical operations.
- In many cases, there are multiple algorithms for finding a mathematical solution.
- When using estimation, the context is very important.

In this unit plan, the following 21st Century themes and skills are addressed.

Career Ready Practices	
1. Act as a responsible and contributing citizen and employee.	**X**
2. Apply appropriate academic and technical skills	**X**
3. Attend to personal health and financial well-being.	**X**
4. Communicate clearly and effectively and with reason.	**X**

5. Consider the environmental, social and economic impacts of decisions	**X**
6. Demonstrate creativity and innovation.	**X**
7. Employ valid and reliable research strategies.	**X**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	**X**
9. Model integrity, ethical leadership and effective management.	**X**
10. Plan education and career paths aligned to personal goals.	**X**
11. Use technology to enhance productivity.	**X**
12. Work productively in teams while using cultural global competence.	**X**

Student Learning Targets/Objectives

- Generalize place value understanding for multi-digit whole numbers by
  - Explaining the value of each digit in a multi-digit number as ten times the digit to the right
  - Reading and writing a multi-digit number in word form, base-ten numerals, and expanded form
  - Comparing two multi-digit number using place value and record the comparison using symbols <, >, or =
  - Explaining how to use place value and what digits to look for in order to round a multi-digit number
  - Using the value of the digit to the right of the place to be rounded to determine whether to round up or down
  - Writing a multi-digit number rounded to any given place
- Use place value understanding and properties of operations to perform multi-digit arithmetic by
  - Adding multi-digit whole numbers with ease by using he standard algorithm
  - Subtracting multi-digit whole numbers with ease by using he standard algorithm
  - Multiplying a multi-digit number by a one-digit by a one-digit whole number
  - Demonstrating multiplication of two two-digit numbers using rectangular arrays, place value, and the area model
  - Solving multiplication of two two-digit numbers using properties of operations and equations
  - Explaining my chosen strategy
  - Demonstrating division of a multi-digit number by a one-digit number using place value, rectangular arrays, and area models
  - Solving division of a multi-digit number by a one-digit number using properties of operations and equations

Assessments

- **Pre and Formative** –
  - Problem Solving Benchmarks
  - Facts Benchmarks
  - Share and Show
  - Teach Observations

- Discussion/Questioning

- **Summative - Other assessment measures**
  - Chapter Tests
- **Other Assessment Measures – Alternate Assessments**
  - Personal Trainer
  - Online digital assessments

Teaching and Learning Actions	
Instructional Strategies Differentiation	**Instructional Strategies** - Breaking down the task - Providing step-by-step prompts - Daily testing - Repeated practice - Sequenced Review - Directed Questioning and Responses - Sequence Tasks from Easy to Difficult - Individual/Small-Group/Whole Class Instruction - Think Aloud - Peer Tutoring - Active Participation - Warm-Up Activities - Meaningful Real Life Connections - Modeling - Teachers demonstrates, student uses models to problem solve - Centers - Manipulatives – Concrete Experiences - Goal Setting - Mental Math - Pencil & Paper Skills - Calculator Use/Technology - Graphic Organizers - Make Predictions/Estimation - Writing Explanations - Scaffolding - Extended Form - Partial Sums/Carrying - Trade First - Borrowing - Draw a Picture - Guess and Check - Working Backwards - Multistep
Activities Differentiation	- A Penny a Day - Leftovers - Mystery Number Place Value - Name that Number - Math in the News- Scavenger Hunt - Fishing for Digits

	- High Number Toss - Subtraction Target Practice - Reviewing Situation Diagrams - Using Fact Triangles to Solve Open Sentences - Playing Base-10 Exchange - Rounding Whole Numbers
Resources	

4.NBT.1

GOMath! Grade 4:

- Lessons: 1.1, 1.5, 4.4, L4 Mid-Chapter Checkpoint

4.NBT.A.2

GOMath! Grade 4:

- Lessons: 1.2, 1.3

4.NBT.A.3

GOMath! Grade 4:

- Lessons: 1.4

4.NBT.B.4

GOMath! Grade 4:

- Lessons: 1.6, 1.7, 1.8

4.NBT.B.5

GOMath! Grade 4:

- Lessons: 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.10,2.11 3.1, 3.2, 3.3, 3.4, 3.5, 3.6

4.NBT.B.6

GOMath! Grade 4:

- Lessons: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12

Suggested Time Frame:	By the end of Grade 4

Content Area:	Mathematics	Grade(s)	4
Unit Plan Title:	Numbers and Operations- Fractions		

Anchor Standard (ELA) or Domain (Math)

Numbers and Operations- 4.NF

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

Overview/Rationale

Students begin developing an understanding of fraction equivalencies and operations with fractions. They recognize that two different fractions can be equal and they develop methods for generating and recognizing equivalent fractions. Students extend previous knowledge about how fractions are built from unit fractions, building' fractions from unit fractions, breaking down fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

Standard(s)

- 4.NF.1 Explain why a fraction $\frac{a}{b}$ is equivalent to a fraction $\frac{n \times a}{n \times b}$ 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.
- 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 fractions such as $\frac{1}{2}$. 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 $\frac{a}{b}$ with a>1 as a sum of fractions $\frac{1}{b}$.
- 4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- 4.NF.B.3b 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.
- 4.NF.3c 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.
- 4.NF.B.4d 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.NF..4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
- 4.NF.B.4a Understand a fraction $\frac{a}{b}$ as a multiple of $\frac{1}{b}$. For example, use a visual fraction model o represent

$\frac{5}{4}$ as a product $5 \times \frac{1}{4}$, recordering the conclusion by the equation $\frac{5}{4} = 5 \times \frac{1}{4}$.

- 4.NF.B.4b Understand a multiple of $\frac{a}{b}$ as a multiple of $\frac{1}{b}$, and use this understanding to multiply a fraction by a whole number. For example, use a visual model to express $3 \times \frac{2}{5}$ as $6 \times \frac{1}{5}$, recognizing this product as $\frac{6}{5}$.
- 4.NF.B.4c 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. For example, if each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers foes your answer lie?
- 4.NF.C.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 $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.
- 4.NF.C.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
- 4.NF.C.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.

Technology Standards

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
- 8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
- 8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
- 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.
- 8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Standards for Mathematical Practice(s)

1. Make sense of problems and persevere in solving problems.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Essential Question(s)

- Why express quantities, measurements, and number relationships in different ways?
- How do mathematical ideas interconnect and build on one another to produce a coherent whole?
- What makes a computational strategy both effective and efficient?

Enduring Understandings

- Fractions and decimals allow for quantities to be expressed with greater precision than with just whole numbers.
- One representation may sometimes be more helpful than another; and used together multiple representatives give a fuller understanding of a problem.
- In many cases, there are multiple algorithms for finding a mathematical solution, and those algorithms are frequently associated with different cultures.

In this unit plan, the following 21st Century Ready Practices are addressed.

Career Ready Practices	
1. Act as a responsible and contributing citizen and employee.	**X**
2. Apply appropriate academic and technical skills	**X**
3. Attend to personal health and financial well-being.	**X**
4. Communicate clearly and effectively and with reason.	**X**
5. Consider the environmental, social and economic impacts of decisions	**X**
6. Demonstrate creativity and innovation.	**X**
7. Employ valid and reliable research strategies.	**X**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	**X**
9. Model integrity, ethical leadership and effective management.	**X**
10. Plan education and career paths aligned to personal goals.	**X**
11. Use technology to enhance productivity.	**X**

12. Work productively in teams while using cultural global competence.	**X**

Student Learning Targets/Objectives

- Extend understanding of fraction equivalence and ordering by
  - Explaining why fractions are equivalent using models
  - Generating equivalent fractions by multiplying
  - Using visual models to justify why multiplying or dividing the numerator and denominator by the same number
  - Explaining that comparing two fractions is valid only when they refer to the same whole
  - Comparing two given fractions by generating equivalent fractions with common denominators
  - Comparing two given fractions by reasoning about their size or their location on a number line, or comparing them to a benchmark fraction
  - Recording the comparison using symbols >, =, or <,and justify each comparison
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers by
  - Using visual models to add and subtract fractions within the same whole
  - Using visual models to decompose a fraction in more than one way, including decomposing a fraction into a sum of its unit fraction
  - Recording decomposition in an equation
  - Adding or subtracting a mixed fraction using equivalent fractions , properties of operations, or the relationship between addition and subtraction
  - Solving addition and subtraction word problems using drawings, pictures, and equations
  - Explaining why $\frac{a}{b} = a \times \frac{1}{b}$ by using visual models to show how to decompose fractions into unit fractions and represent it as a multiple of unit fractions
  - Decomposing a fraction into a multiple of unit fractions in order to show why multiplying a whole number by a fraction $n \times \frac{a}{b}$ results in $\frac{n \times a}{b}$
  - Solving word problems that involve multiplying a whole number and fraction with visual models and equations
- Understand decimal notation for fractions, and compare decimal fractions by
  - Rewriting a fraction with a denominator 10 as an equivalent fraction with denominator 100
  - Adding two fractions with denominators 10 and 100
  - Explaining the relationship between a fraction and a decimal representation
  - Representing fractions with denominators of 10 and 100 as a decimal
  - Identifying the tenths and hundredths place of a decimal
  - Showing the placement of a decimal on a number line
  - Explaining that comparing two decimals is valid only when they refer to the same whole
  - Justifying the comparison by reasoning about the size of the decimals and by using a visual model
  - Comparing two decimals to the hundredths place and record the comparison using symbols >, =, or <.

Assessments

- **Pre and Formative** –
  - Problem Solving Benchmarks
  - Facts Benchmarks
  - Share and Show

- **Summative - Other assessment measures**
  - Chapter Tests

- **Other Assessment Measures- Alternate Assessments**
  - Personal Math Trainer

Teaching and Learning Actions

Instructional Strategies Differentiation	**Instructional Strategies** - Breaking down the task - Providing step-by-step prompts - Daily testing - Repeated practice - Sequenced Review - Directed Questioning and Responses - Sequence Tasks from Easy to Difficult - Individual/Small-Group/Whole Class Instruction - Think Aloud - Peer Tutoring - Active Participation - Warm-Up Activities - Meaningful Real Life Connections - Modeling - Teachers demonstrates, student uses models to problem solve - Centers - Manipulatives – Concrete Experiences - Goal Setting - Mental Math - Pencil & Paper Skills - Calculator Use/Technology - Graphic Organizers - Make Predictions/Estimation - Writing Explanations - Scaffolding - Extended Form - Partial Sums/Carrying - Trade First - Borrowing - Draw a Picture - Guess and Check - Working Backwards - Multistep
Activities Differentiation	- Eggsactly Eggs - Who Am I? Puzzles

	- Decomposed Equivalent Fractions Name Collection Box - Fraction Sundaes - Fraction Buckets - Equivalent Fractions Name Collection Box - Fraction Wall Game - Birthday Fractions - Sums of 1 - Adding Fractions Using Pattern Blocks - Decomposing Fractions - Exploring Fractions of a Set - Building Rectangles - Fraction Chain - ZAP! - Getting to One - Fraction Of - Fraction/Percent Concentration
Resources	

4.NF.A.1

GOMath! Grade 4:

- Lessons: 6.1, 6.2, 6.3, 6.4, 6.5

4.NF.A.2

GOMath! Grade 4:

- Lessons: 6.6, 6.7, 6.8

4.NF.B.3a

GOMath Grade 4:

- Lessons: 7.1,

4.NF.B.3b

GOMath! Grade 4:

- Lessons: 7.2

4.NF.B.3c

GOmath! Grade 4:

- Lessons: 7.7, 7.8, 7.9

4.NF.B.3d

GOMath! Grade 4:

- Lessons: 7.3, 7.4, 7.5, 7.6, 7.10

4.NF.B.4a

GOMath! Grade 4:

- Lessons: 8.1,

4.NF.B.4b

GOMath! Grade 4:

- Lessons: 8.2, 8.3

4.NF.B.4c

GOMath Grade 4:

- Lessons: 8.2, 8.3, 8.4, 8.5

4.NF.C.5

GOMath! Grade 4:

- Lessons: 9.3, 9.6

4.NF.C.6

GOMath! Grade 4:

- Lessons: 9.1, 9.2, 9.4

4.NF.C.7

GOMath Grade 4:

- Lessons: 9.7

Suggested Time Frame:	By the end of Grade 4

Content Area:	Mathematics	Grade(s)	4
Unit Plan Title:	Measurement and Data		

Anchor Standard (ELA) or Domain (Math)

Measurement and Data- 4.MD

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

Overview/Rationale

Students will describe how measurement is used in everyday situations, and use this knowledge to solve problems involving measurement. Students will be able to convert measurements given in a larger unit into an equivalent measurement in smaller units. Students will be able to discover and use the formulas for area and perimeter and use them to solve real-world situations. Students will be able to create and interpret line plots. Students will be able to use a protractor to measure angles, and sketch angles given a specific degree measurement.

Standard(s)

- 4.MD.A.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. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36),…
- 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including 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.A.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 florring and the length, by viewing the area formula as a multiplication equation with an unknown factor.
- 4.MD.B.4 Make a line plot to display a data set of measurements in fractions of a unit (halves, fourths, and eighths). 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.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement.
- 4.MD.C.5a 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 $\frac{1}{360}$ of a circle is called a “one-degree angle,” and can be used to measure

angles.

- 4.MD.C.5b An angle that turns through *n* one-degrees using a protractor is said to have an angle measure of *n* degrees.
- 4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
- 4.MD.C.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.

Technology Standards

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
- 8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
- 8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
- 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.
- 8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Standards for Mathematical Practice(s)

1. Make sense of problems and persevere in solving problems.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Essential Question(s)

- Why does “what” we measure influence “how” we measure?
- Why display data in different ways?
- How can measurements be used to solve problems?

Enduring Understandings

- Measurement processes are used in everyday life to describe and quantify the world.
- Data displays describe and represent data in alternative ways.
- Phenomena can be described and compared using measurement.

In this unit plan, the following 21st Century Career Ready Practices are addressed.

Career Ready Practices	
1. Act as a responsible and contributing citizen and employee.	**X**
2. Apply appropriate academic and technical skills	**X**
3. Attend to personal health and financial well-being.	**X**
4. Communicate clearly and effectively and with reason.	**X**
5. Consider the environmental, social and economic impacts of decisions	**X**
6. Demonstrate creativity and innovation.	**X**
7. Employ valid and reliable research strategies.	**X**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	**X**
9. Model integrity, ethical leadership and effective management.	**X**
10. Plan education and career paths aligned to personal goals.	**X**
11. Use technology to enhance productivity.	**X**
12. Work productively in teams while using cultural global competence.	**X**

Student Learning Targets/Objectives

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit by
  - Describing the relative size of measurement units (e.g., km, m, cm; kg, g; lb, oz; l, ml; hr, min, sec)
  - Representing a larger unit as a multiple of smaller units within the same system of measurement and record the equivalent measures in a two column table (e.g., 1 foot = 12 inches, 2 feet = 24 inches, 3 feet = 36 inches)
  - Representing measurements using diagrams and correct measurement scale
  - Using the four operations to solve measurement word problems
  - Solving word problems involving various measurements expressed by whole numbers, fractions, and decimals
  - Converting a measurement given in a larger unit into an equivalent measurement in smaller units in order to solve a problem
  - Explaining the formulas for area and perimeter
  - Using the formulas for area and perimeter to solve real world problems
- Represent and interpret data by
  - Creating a line plot with a given data set of measurements using fractions as a unit

- Using the information on the line plot to solve addition and subtraction problems
- Geometric measurement: understand concepts of angle and measure angles by
  - Identifying the parts of an angle (vertex, common endpoint, rays) and define an angle
  - Explaining that an angle is measured in degrees related to the 360 degrees in a circle
  - Measuring an angle using a protractor in whole-number degrees
  - Sketching angles with a given measurement
  - Explaining that the angle measurement of a larger angle is the sum of the angle measures of its decomposed parts
  - Writing an equation with an unknown angle measurement
  - Using addition and subtraction to solve for the missing angle measurements
  - Solving word problems involving unknown angles

Assessments

- **Pre and Formative** –
  - Problem Solving Benchmarks
  - Share and Show
- **Summative - Other assessment measures**
  - Chapter Tests
- **Other Assessment Measures**
  - Personal Math Trainer
  - Online digital assessments

Teaching and Learning Actions

Instructional Strategies Differentiation	**Instructional Strategies** - Breaking down the task - Providing step-by-step prompts - Daily testing - Repeated practice - Sequenced Review - Directed Questioning and Responses - Sequence Tasks from Easy to Difficult - Individual/Small-Group/Whole Class Instruction - Think Aloud - Peer Tutoring - Active Participation - Warm-Up Activities - Meaningful Real Life Connections - Modeling - Teachers demonstrates, student uses models to problem solve - Centers - Manipulatives – Concrete Experiences - Goal Setting - Mental Math - Pencil & Paper Skills - Calculator Use/Technology - Graphic Organizers

	- Make Predictions/Estimation - Writing Explanations - Scaffolding - Extended Form - Draw a Picture - Guess and Check - Working Backwards - Multistep -
Activities *Differentiation*	- Angle Tangle - Rugs and Fences - Number Top It(decimal) - Perimeter Activity - Finding Landmarks - Exploring Range, Median and Mode - Designing a Measurement Scavenger Hunt - Pattern Blocks - Modeling Angles - Geoboards - Measure to Foot - Geoboard: Searching for Squares - Counting Squares to Find Area - Finding Area of Rectangles - Playing Robot - Geoboard Areas - Estimating Area of Irregular Regions - Constructing a “Real Graph” - Exploring the Relationship between metric Units - Matching Metric Units - How Many Degrees? - Angles on a Right Triangle - Pattern Block Perimeters - Measuring to the Nearest Foot - Investigating Geoboard Areas - Counting Squares to Find Areas - Ordering Weight - Personal Math Trainer
Resources	

4.MD.A.1

GOMath! Grade 4:

- Lessons: 12.1, 12.2, 12.3, 12.4, 12.6, 12.7, 12.8, 12.11

4.MD.A.2

GOMath! Grade 4:

- Lessons: 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.10, 9.5 12.9, 12.10

4.MD.A.3

GOMath! Grade 4:

- Lessons: 13.1, 13.2, 13.3, 13.4, 13.5

4.MD.B.4

GOMath! Grade 4:

- Lessons: 12.5

4.MD.C.5a

GOMath! Grade 4:

- Lessons: 11.1, 11.2

4.MD.C.5b

GOMath! Grade 4:

- Lessons: 11.2

4.MD.C.6

GOMath! Grade 4:

- Lessons: 11.3

4.MD.C.7

GOMath! Grade 4:

- Lessons: 11.4, 11.5

Suggested Time Frame:	By the end of Grade 4

Content Area:	Mathematics	Grade(s)	4
Unit Plan Title:	Geometry		

Anchor Standard (ELA) or Domain (Math)

Geometry- 4.G

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

Overview/Rationale

Students describe, analyze, compare, and classify two-dimensional shapes. Students deepen their understanding of properties of two-dimensional objects through building, drawing, and analyzing two-dimensional shapes. Students apply their understanding of two-dimensional objects to solve problems involving symmetry.

Standard(s)

- 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 4.G.A.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 specified size. Recognize right triangles as a category, and identify right triangles.
- 4.G.A.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-symmetric figures and draw lines of symmetry.

Technology Standard(s)

- 8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
- 8.1.5.A.2 Format a document using a word processing application to enhance text and include graphics, symbols and/ or pictures.
- 8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.
- 8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains the analysis of the data.
- 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities.
- 8.1.2.C.1 Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.

Standards for Mathematical Practice(s)

1. Make sense of problems and persevere in solving problems.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.

6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Essential Question(s)

- How does geometry better describe objects?
- How does understanding geometric relationships help solve problems?

Enduring Understandings

- Geometric attributes (such as shapes, lines, angles, figures, and planes) provide descriptive information about an object's properties and position in space and support visualization and problem solving.
- Geometric relationships create pathways to understanding a variety of phenomena.

In this unit plan, the following 21st Century Career Ready Practices addressed.

Career Ready Practices	
1. Act as a responsible and contributing citizen and employee.	**X**
2. Apply appropriate academic and technical skills	**X**
3. Attend to personal health and financial well-being.	**X**
4. Communicate clearly and effectively and with reason.	**X**
5. Consider the environmental, social and economic impacts of decisions	**X**
6. Demonstrate creativity and innovation.	**X**
7. Employ valid and reliable research strategies.	**X**
8. Utilize critical thinking to make sense of problems and persevere in solving them.	**X**
9. Model integrity, ethical leadership and effective management.	**X**
10. Plan education and career paths aligned to personal goals.	**X**
11. Use technology to enhance productivity.	**X**
12. Work productively in teams while using cultural global competence.	**X**

Student Learning Targets/Objectives

- Draw and identify lines and angles, and classify shapes by properties of their lines and angles by
  - Drawing an example of a point, line, line segment, ray, right angle, acute angle, obtuse angle, perpendicular lines, and parallel lines.
  - Looking for and identifying the following in a given two-dimensional figure: point, line, line segment, ray, right angle, acute angle, obtuse angle, perpendicular lines, and parallel lines.
  - Classifying two-dimensional shapes into the following categories: those with parallel lines, those with perpendicular lines, those with both parallel and perpendicular lines, those with no parallel or perpendicular lines.
  - Classifying two-dimensional shapes into categories based on the presence or absence of acute, obtuse, or right angles
  - Identifying a right triangle
  - Identifying line-symmetric figures
  - Defining line of symmetry, explain how to identify it in a two-dimensional figure and explain how folding along the line of symmetry results in matching parts
  - Drawing a line on a figure to create two symmetrical figures

Assessments

- **Pre and Formative** –
  - Problem Solving Benchmarks
  - Questioning/Discussion
  - Teacher Observation
  - Share and Show

- **Summative - Other assessment measures**
  - Chapter Tests

- **Other Assessment Measures**
  - Personal Math Trainer
  - Online digital assessments

Teaching and Learning Actions

Instructional Strategies Differentiation	**Instructional Strategies** - Breaking down the task - Providing step-by-step prompts - Daily testing - Repeated practice - Sequenced Review - Directed Questioning and Responses - Sequence Tasks from Easy to Difficult - Individual/Small-Group/Whole Class Instruction - Think Aloud - Peer Tutoring - Active Participation - Warm-Up Activities - Meaningful Real Life Connections

	- Modeling - Teachers demonstrates, student uses models to problem solve - Centers - Manipulatives – Concrete Experiences - Goal Setting - Mental Math - Pencil & Paper Skills - Calculator Use/Technology - Graphic Organizers - Make Predictions/Estimation - Writing Explanations - Scaffolding - Draw a Picture - Guess and Check - Working Backwards - Multistep
Activities Differentiation	- Sprouts - Polygon Pair-Up - Angle Tangle - Sorting Pattern Blocks - Geoboards: Parallel Lines - Constructing Polygons on a Geoboard - Modeling Angles - Playing Robot - Identifying Polygon Properties - Making & Using a Place Value Tool - Angles on a Right Triangle - Comparing Geometric Solids - Sorting Geometric Solids - Exploring Reflections & Lines of Reflections - Creating Reflections with Pattern Blocks - Exploring Line Symmetry - Personal Trainer
Resources	
4.G.1 GoMath! Grade 4: • Lessons: 10.1, 10.3 **4.G.2** Everyday Mathematics Grade 4: • Lessons: 10.2, 10.4 **4.G.3** Everyday Mathematics Grade 4: • Lessons: 10.5, 10.6	
Suggested Time Frame:	By the end of Grade 4