

TRUMBULL PUBLIC SCHOOLS
Trumbull, Connecticut

Mathematics
Grade 4

2014

Updated Math Pilot, September 2021
New resources identified in BLUE

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Grade 4 Mathematics

Table of Contents

Core Values and Beliefs	3
Introduction	3
Philosophy	4
Course Description.....	4
Goals	5
Trimester 1	6
Trimester 2	7
Trimester 3	8
Text(s)	9
Supplementary Materials/Resources/Technology	10
Vocabulary	12
Rubrics	14
Resource file/ Appendices.....	14
Current References	14

The Trumbull Board of Education, as a matter of policy, prohibits discrimination on the grounds of age, creed, religion, sex, race, color, handicap, political affiliation, marital status, sexual orientation, or national origin.

CORE VALUES AND BELIEFS

The Trumbull Public Schools Community, which engages in an environment conducive to learning, believes that all students will read and write effectively, therefore communicating in an articulate and coherent manner. All students will participate in activities that address problem-solving through critical thinking. Students will use technology as a tool in decision making. We believe that by fostering self-confidence, self-directed and student-centered activities, we will encourage independent thinking and learning. We believe ethical conduct to be paramount in sustaining our welcoming school climate.

INTRODUCTION

The Elementary Math Curriculum was last revised in 2005 and was aligned to the CT Frameworks for Mathematics. In 2010, the State of Connecticut adopted the Common Core State Standards (CCSS) prompting all Connecticut schools to use these standards to guide instruction. This curriculum guide reflects the necessary changes to our curriculum for alignment with the CCSS. It also includes specific grade level expectations and resources appropriate for this grade, making it a truly teacher-friendly instructional guide for ease in delivery. Appropriate professional development will further aid in fidelity to the implementation of the CCSS and assured use of the resources provided for instruction.

Please note: Minor adjustments to this curriculum guide may be necessary to adhere to the CCSS. As additional state and national resources are shared, the district will add essential information to this document.

PHILOSOPHY

Success in mathematics depends upon active involvement in a variety of interrelated experiences. When students participate in stimulating learning opportunities, they can reach their full potential.

The Trumbull Mathematics Program embraces these goals for all students.

The successful mathematician will:

- Acquire the factual knowledge necessary to solve problems
- Gain procedural proficiency in problem solving
- Demonstrate a perceptual understanding of problems posed
- Make meaningful mathematical connections to their world
- Solve problems utilizing a variety of strategies
- Utilize technology to improve the quality of the problem solving process
- Communicate effectively using mathematical terminology, both independently and collaboratively
- Use sound mathematical reasoning by utilizing the power of conjecture and proof in their thinking
- Become reflective thinkers through continuous self-evaluation
- Become independent, self-motivated, lifelong learners

The Trumbull Mathematics Program promotes the empowerment of students and encourages students to embrace the skills needed to become successful in the 21st century. Students expand their mathematical abilities by investigating real world phenomena. Through such experiences, students can access the beauty and power of mathematics and truly appreciate the impact it has on the world in which they live.

Developed by Trumbull K-12 Math Committee, June 2004; revised and approved April 2011

COURSE DESCRIPTION

In Grade 4, instructional time should focus on three critical areas:

1. Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.
2. Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators and multiplication of fractions by whole numbers.
3. 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.

GOALS Grade 4

1. *Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends*

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.

2. *Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, multiplication of fractions by whole numbers*

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.

3. *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 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.

Grade 4 Mathematics: Trimester 1 (61 Days)

Unit Name: Grade 4 Trimester 1					
Content and Skills					
Mathematical Practices: See Addendum for Mathematical Practices Poster					
Quantity, Measurement, and Data:					
<ul style="list-style-type: none"> ▪ Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. ▪ Geometric measurement: understand concepts of angle and measure angles. 					
Numeration, Operations, and Algebraic Thinking:					
Operations and Algebraic Thinking					
<ul style="list-style-type: none"> ▪ Use the four operations with whole numbers to solve problems. ▪ Gain familiarity with factors and multiples. 					
Number and Operations in Base Ten					
<ul style="list-style-type: none"> ▪ Generalize place value understanding for multi-digit whole numbers. ▪ Use place value understanding and properties of operations to perform multi-digit arithmetic. 					
Geometry:					
<ul style="list-style-type: none"> ▪ Draw and identify lines and angles, and classify shapes by properties of their lines and angles. 					
Essential Question(s): Taken from the CCSS Mathematical Practices					
<ul style="list-style-type: none"> ▪ What is the problem asking? Does this make sense? (MP1) ▪ Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree? (MP3) ▪ Can I model my thinking using manipulatives, words, numbers or pictures? (MP4) ▪ Is my answer correct? How can I prove it mathematically? (MP6 and 7) 					
Focus Question(s): These will be content specific (i.e. Explain how you arrived at an answer)					
<ul style="list-style-type: none"> ▪ Can you solve using a different strategy? ▪ Can you critique or agree with another person's strategy? 					
Common Core State Standards for Mathematics <i>(See Appendix for complete description)</i>	Time Allotment	Assured Learner Activities	Assessment		
<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; padding: 5px;">4.OA.1 4.OA.2 4.OA.3 4.OA.4 4.OA.5</td> <td style="width: 50%; padding: 5px;">4.NBT.1 4.NBT.2 4.NBT.3 4.NBT.4 4.MD.1 4.MD.2</td> </tr> </table>	4.OA.1 4.OA.2 4.OA.3 4.OA.4 4.OA.5	4.NBT.1 4.NBT.2 4.NBT.3 4.NBT.4 4.MD.1 4.MD.2	70 minutes daily per Trumbull Board of Education Policy # 6112.2	<ul style="list-style-type: none"> ▪ Great Minds: Eureka Math ▪ Fact Fluency Practice 	<ul style="list-style-type: none"> ▪ Classroom mathematical discourse ▪ Eureka Assessments ▪ i-Ready Assessment
4.OA.1 4.OA.2 4.OA.3 4.OA.4 4.OA.5	4.NBT.1 4.NBT.2 4.NBT.3 4.NBT.4 4.MD.1 4.MD.2				
Technology Competency Standards <i>(See Appendix for complete description)</i>					
2. Communicate and Collaborate 4. Critical Thinking 5. Digital Citizenship					

Grade 4 Mathematics: Trimester 2 (60 Days)

Unit Name: Grade 4 Mathematics: Trimester 2																							
Content and Skills																							
Mathematical Practices: See Addendum for Mathematical Practices Poster																							
Quantity, Measurement, and Data:																							
<ul style="list-style-type: none"> ▪ Geometric Measurement: Understand concepts of angle and measure angles. 																							
Numeration, Operations, and Algebraic Thinking:																							
Number and Operations in Base Ten																							
<ul style="list-style-type: none"> ▪ Generalize place value understandings for multi-digit whole numbers. ▪ Use place value understanding and properties of operations to perform multi-digit arithmetic. ▪ Gain familiarity with factors and multiples and Generate and analyze patterns. 																							
Number and Operations - Fractions																							
<ul style="list-style-type: none"> ▪ Extend understanding of fraction equivalence and ordering. ▪ Build fraction units from unit fractions by applying and extending previous understandings of operations on whole numbers. ▪ Understand decimal notation for fractions and compare decimal fractions. 																							
Geometry:																							
<ul style="list-style-type: none"> ▪ Draw and identify lines and angles, and classify shapes by properties of their lines and angles. 																							
Essential Question(s): Taken from the CCSS Mathematical Practices																							
<ul style="list-style-type: none"> ▪ What is the problem asking? Does this make sense? (MP1) ▪ Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree? (MP3) ▪ Can I model my thinking using manipulatives, words, numbers or pictures? (MP4) ▪ What patterns do I see in Quick Images? (MP6 and 7) 																							
Focus Question(s): These will be content specific (i.e. Explain how you arrived at an answer)																							
<ul style="list-style-type: none"> ▪ Can you solve using a different strategy? ▪ Can you critique or agree with another person's strategy? 																							
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Technology Competency Standards <i>(See Appendix for description)</i>																							
<ul style="list-style-type: none"> 2. Communicate and Collaborate 4. Critical Thinking 5. Digital Citizenship 																							

Grade 4 Mathematics: Trimester 3 (60 Days)

Unit Name: Grade 4 Mathematics: Trimester 3					
<p>Content and Skills</p> <p>Mathematical Practices: See Addendum for Mathematical Practices Poster</p> <p>Quantity, Measurement, and Data:</p> <ul style="list-style-type: none"> ▪ Solve problems involving and conversion of measurements from a larger unit to a smaller unit. <p>Numeration, Operations, and Algebraic Thinking:</p> <p>Operations and Algebraic Thinking</p> <ul style="list-style-type: none"> ▪ Use the four operations with whole numbers to solve problems. ▪ Generate and analyze patterns. <p>Number and Operations in Base Ten</p> <ul style="list-style-type: none"> ▪ Generalize place value understandings for multi-digit whole numbers. ▪ Use place value understanding and properties of operations to perform multi-digit arithmetic. <p>Number and Operations – Fractions</p> <ul style="list-style-type: none"> ▪ Understand decimal notation from fractions, and compare decimal fractions. <p>Geometry:</p> <ul style="list-style-type: none"> ▪ N/A 					
<p>Essential Question(s): Taken from the CCSS Mathematical Practices</p> <ul style="list-style-type: none"> ▪ What is the problem asking? Does this make sense? (MP1) ▪ Can I clearly explain my reasoning? Can I understand the reasoning of others? Do I agree or disagree? (MP3) ▪ Can I model my thinking using manipulatives, words, numbers or pictures? (MP4) ▪ What patterns do I see in Quick Images? (MP6 and 7) <p>Focus Question(s): These will be content specific (i.e. Explain how you arrived at an answer)</p> <ul style="list-style-type: none"> ▪ Can you solve using a different strategy? ▪ Can you critique or agree with another person’s strategy? 					
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Technology Competency Standards <i>(See Appendix for complete description)</i>					
2. Communicate and Collaborate 4. Critical Thinking 5. Digital Citizenship					

Instructional/Teaching Strategies

Common Core State Standards 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 a structure.
8. Look for and express regularity in repeated reasoning.

Brainstorming; Classroom Discourse; Computational Fact Fluency Practice; Daily Classroom Routines; Model Instruction; Small Group Instruction; Whole Class Instruction; Peer Modeling; Problem Solving Strategies; Mathematical Vocabulary Walls; Math Journals; Word Problem Interpretation and Creation; Use Technology to Solve Problems; Question and Answer Sessions; Refocus Students; Flexible Grouping; Ten-Minute-Math; Use Graphic Organizers; Use Math Games; Identify Similarities and Differences, Note Taking, and Wait Time.

Updated Texts

Eureka Math published by Great Minds, 2015

SUPPLEMENTARY MATERIALS, RESOURCES, and TECHNOLOGY

Supplementary Materials:

- Manipulatives materials
 - 1 Inch color tiles
 - Dice
 - Geoboards
 - Geometric Solids
 - Meter/Yardsticks
 - Number line
 - Power Polygons
 - Rulers
 - Snap cubes
 - Fraction Kits
 - Base Ten Blocks

Resources:

<i>Groundworks: Algebraic Thinking</i>	<i>Dr. Carole Greenes Dr. Carol Findell</i>	<i>The Wright Group</i>	<i>2006</i>
<i>Groundworks: Reasoning with Data and Probability</i>	<i>Dr. Carole Greenes Dr. Carol Findell Dr. Tammy Tsankova Dr. Barbara Irvin</i>	<i>The Wright Group</i>	<i>2006</i>
<i>Groundworks: Reasoning About Measurement</i>	<i>Dr. Carole Greenes Dr. Carol Findell Dr. Linda Schulman Dacey Dr. Rika Spungin</i>	<i>The Wright Group</i>	<i>2003</i>
<i>Math To Know Handbook</i>	<i>Mary C. Cavanagh</i>	<i>Houghton Mifflin Company</i>	<i>2000</i>
<i>Math To Know Teacher's Resource Book</i>	<i>Mary C. Cavanagh</i>	<i>Houghton Mifflin Company</i>	<i>2000</i>

Websites:

- **Common Core State Standards for Mathematics:**
<http://www.corestandards.org/Math>
- **National Council of Teachers of Mathematics:** www.nctm.org
- **Smarter Balanced Assessment Consortium:**
<http://www.smarterbalanced.org/>

Grade 4 Vocabulary:

A.M.	Commutative Property of Addition	Even number	Line
Acute angle	Commutative Property of Multiplication	Expanded form	Line of symmetry
Acute triangle	Compare	Experiment	Line plot
Add	Compatible numbers	Expression	Line segment
Addend	Compose	Fact family	Liter
Additive Comparison	Composite number	Factor	Lowest terms
Additive Identity Property of 0	Congruent	Factor pairs	Mass
Algorithm	Counter clockwise	Fluid ounce	Meter
Angle	Counting number	Foot	Metric system
Angle measure	Cup	Formula	Midnight
Arc	Customary system	Fourths	Mile
Area	Data	Fraction	Milliliter
Area Model	Day	Fraction bar	Millimeter
Arithmetic Patterns	Decimal	Fraction greater than one	Minute
Array	Decimal point	Fraction less than one	Mixed number
Associative Property of Addition	Decimeter	Gallon	Month
Associative Property of Multiplication	Decompose	Gram	Multiple
Attribute	Degree	Greater than	Multiplicative comparison
Bar graph	Denominator	Half gallon	Multiplicative Identity Property of 1
Bar model	Diagonal	Height	Multiply
Base	Difference	Hexagon	Number line
Base-ten numeral form	Digit	Horizontal	Number name
Base-ten numerals	Digital clock	Hour	Numerator
Benchmark	Distributive Property	Hundreds	Noon
Benchmark fractions	Divide	Hundredth	Obtuse angle
Capacity	Dividend	Hundredths	Obtuse triangle
Centimeter	Divisible	Inch	Octagon
Classify	Divisor	Intersecting lines	Odd number
Clockwise	Elapsed time	Interval	Ones
Closed shape	Endpoint	Inverse operations	Open shape
Column	Equal	Isosceles triangle	Order
Common denominator	Equation	Kilogram	Order of Operations
Common factor	Equivalent decimals	Kilometer	Ounce
Common multiple	Equivalent fractions	Length	
Common numerator	Estimate	Less than	
		Like denominators	

P.M.	Related facts	Term	
Parallel lines	Regular polygon	Thirds	
Parallelogram	Remainder	Thousands	
Parentheses	Repeated addition	Tiling	
Partial product	Repeated subtraction	Time interval	
Partition	Rhombus	Ton	
Pattern	Right angle	Trapezoid	
Pentagon	Right triangle	Triangle	
Period	Round a whole number	Two dimensional figure	
Perimeter	Row	Unit fraction	
Perpendicular	Scale	Unit square	
Perpendicular lines	Scalene triangle	Unlike denominators	
Picture graph	Second	Variable	
Pint	Sequence	Venn Diagram	
Place value	Sides of equal length	Vertex	
Plane shape	Simplest form	Vertical	
Point	Simplify	Vertices	
Pound	Sixths	Volume	
Polygon	Skip count	Week	
Prime number	Square	Weight	
Product	Square unit	Whole	
Protractor	Standard form	Whole numbers	
Quadrilateral	Straight angle	Width	
Quart	Subtract	Word form	
Quarter hour	Sum	Yard	
Quotient	Survey	Year	
Ray	Tally table	Zero property of multiplication	
Reasonableness	Ten Tens		
Rectangle	Tenths		
Regroup			

July 2014: Vocabulary adapted from the Granite Public Schools: www.graniteschools.org

RUBRICS

- *Report Card Rubric (Teachers Only Appendix)*
- *Basic Fact Rubric (Teachers Only Appendix)*

RESOURCE FILE and APPENDICES

- *Common Core State Standards for Mathematics*
- *Mathematical Practices Poster*
- *Technology Competency Standards*
- *Grade 4 District Basic Facts Plan*
- *Grade 4 Report Card*
- *Grade 4 Pacing Guides*
- *Grade 4 Parent Report Card Companion*

CURRENT REFERENCES

Common Core State Standards for Mathematics

www.corestandards.org

International Society for Technology in Education

www.iste.org/STANDARDS

National Council of Teachers of Mathematics

www.nctm.org

Connecticut's Common Core Standards

Mathematics – 4th Grade Standards

Operations and Algebraic Thinking - Use the four operations with whole numbers to solve problems.

- 4.OA.A.1: Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.A.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. (Note: See Glossary, Table 2.)
- 4.OA.A.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.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.

Generate and analyze patterns.

- 4.OA.B.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 - Note: Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.

Generalize place value understanding for multi-digit whole numbers.

- 4.NBT.A.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 $700 \div 70 = 10$ 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 $>$, $=$, and $<$ symbols to record the results of comparisons.
- 4.NBT.A.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.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-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.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.

Number and Operations – Fractions - Note: Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, & 100.

Extend understanding of fraction equivalence and ordering.

4.NF.A.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.

4.NF.A.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.

4.NF.B.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:* $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
- 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.NF.B.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 $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*
- 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 $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)*
- 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.

- 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 $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.* (Note: Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.)
- 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.

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

- 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 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.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 flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Represent and interpret data.

- 4.MD.B.4: Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). 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.

- 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:
- 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.
 - An angle that turns through n one-degree angles 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.

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

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.

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.**

Technology Competency Standards

1. Creativity and Innovation - Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology.
2. Communication and Collaboration - Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
3. Research and Information Fluency - Students apply digital tools to gather, evaluate, and use information.
4. Critical Thinking, Problem Solving, and Decision Making - Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
5. Digital Citizenship - Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
6. Technology Operations and Concepts – Students demonstrate a sound understanding of technology concepts, systems, and operations.