Mathematics Department
Grade 4

Developed By: Grade 4 Teachers
Effective Date: Fall 2020

Scope and Sequence

Month	Grade 4
September	Grade 4 Math Baseline Assessment (by September 14)- HOLD OFF **Chapter 1 Place Value of Whole Numbers** **Focus Lesson: 1.2a Addition of Multi-Digit Numbers (After Lesson 2) (4.NBT.4) TEA 276A** **Focus Lesson: 1.2b Subtraction of Multi-Digit Numbers (After Lesson 2.a) (4.NBT.4) TEA 276B**
October	**Focus Lesson: 3.0.a Multiply Using Arrays (Before Ch 3 Lesson 1) (4.NBT.5) TEA 276D** **Chapter 3 Whole Number Multiplication & Division** **Focus Lesson: 3.1.a Multiply Using Area Models (After Lesson 1) (4.NBT.5) TEA 276E** ***Before Starting Division (Lesson 3.3) -Go Back to Grade 3 Chapter 8- Long Division** **Focus Lesson: 3.5.a Multiplication and Division: Real World Problems (After Lesson 5) (4.OA.2, 4.OA.3) TEA 276F**
November	**Chapter 2 Estimation & Number Theory** **Grade 4 Benchmark Assessment 1 (by November 30) (Chapters 1 through 3)**
December	**LOTS of Reinforcement - Chapter 14 Grade 3** **Focus Lesson: 6.0.a Comparing Unlike Fractions (Before Ch 6 Lesson 1) (4.NF.2) TEA 276H** **Chapter 6 Fractions & Mixed Numbers** **Add and Subtract Like Fractions Only** - Can pick up unlike fractions at the end of the year *Skip 6.1 and 6.2 Do Lessons 6.3 through 6.7 **Focus Lesson: 6.7a Multiplying Fractions and Whole Numbers (After Lesson 7) (4.NF.4.c) TEA 276I** Do Lesson 6.8 **Focus Lesson: 6.8a Line Plots with Fractions of a Unit (After Lesson 8) (4.MD4.) TEA 276J (Line plots are the main DATA focus for Grade 4.)**
January	**Finish Fractions Unit** **Use Revised Chapter 6 Test - In Drive**

	Chapter 7 Decimals- Can skip 7.4 (Rounding decimals?)
February	**Finish Chapter 7 Decimals** **Grade 4 Benchmark Assessment 2 (by February before break) (Chapters 6 and 7 as described above)** **Lots of Foundation- Go Back to Grade 3- Ch 17/18** **Chapter 10 Perpendicular and Parallel Lines** **Chapter 11 Squares and Rectangles** **Chapter 12 Area & Perimeter**
March	**After Chapter 12:** **Go Back to Grades 2 and 3- Look to see how mass and volume were introduced** **Grade 2 Mass (Ch 8) Volume (Ch 9)- Grade 3 Ch 11 and 12** **Focus Lesson: 12.0.a Measurement: Length (4.MD.1) TEB 242D** ***Go Back to Grade 3 Chapter 15- Lessons 15.2 and 15.3 Measuring Weight and Capacity** **Focus Lesson: 12.0.b Measurement: Mass and Weight (4.MD.1) TEB 242G** **Focus Lesson: 12.0.c Measurement: Time (4.MD.1) TEB 242I** **Focus Lesson: 12.0.d Real World Problems: Measurement (4.MD.2) TEB 242K**
April	**Chapter 9: Angles** **Focus Lesson: 9.3a Understanding Angle Measurement (After Lesson 3) (4.MD.5.a) TEB 242A** **Focus Lesson: 9.3.d Understanding Angle Measure is Additive (After Lesson 3.a) (4.MD.7) TEB 242B** **Grade 4 Benchmark Assessment 3 (by April Break) (Chapters 9, 10, 11, 12.0, and 12)** **First Go Back to Grade 3 Chapter 18 Two-D Shapes (18.3- Symmetry)** **Chapter 13 Symmetry (13.1 only- Line Symmetry)**
May	**Chapter 4 Table and Line Graphs** **Grade 4 Math Spring Summative Assessment by May 31 (will assess all Grade 4 Standards up to this point)**
June	Go back to Chapter 6 (Adding & Subtracting Fractions with unlike denominators) or Chapter 8 Adding and Subtracting Decimals (In Preparation for Grade 5) **Use Grade 3 Chapter 10? (Money Real World Problems)???**

Unit 1
Whole Numbers
Summary and Rationale

Number theory, the study of whole numbers and their properties, has a long history and is still an active field of inquiry. In this unit, place value concepts are reviewed and extended to the ten thousands place. Students represent numbers to 100,000 in various ways and apply what they know about comparing numbers to larger numbers.

Students build on their knowledge of rounding numbers to estimate sums, differences, products, and quotients and use estimation skills to determine if an answer is reasonable. They determine if estimates or exact answers are needed and apply estimation skills in real-world situations.

Students are introduced to factors, multiples, least common multiples, and greatest common factors in this unit. They use basic multiplication and division facts to find factors and multiples, break down whole numbers into factors, and multiply them to get multiples.

Students advance to multiplying and dividing multi-digit numbers. The place-value concept, which students are familiar with, is used in multiplication and division. Students discover that division is the inverse of multiplication and use estimation to check the reasonableness of answers.

Recommended Pacing
Standards

Number and Operations in Base Ten

4.NBT.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.
4.NBT.5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
4.NBT.6	Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
Operations and Algebraic Thinking	
4.OA.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.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]
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.OA.4	Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
4.OA.5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*
Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.

K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
K-12.MP.7	Look for and make use of structure.
K-12.MP.8	Look for and express regularity in repeated reasoning.

Interdisciplinary Connections

Standard x.x

Integration of Technology

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Whole numbers can be compared and ordered according to the place value of their digits. When two factors are multiplied, the product is a multiple of both numbers. Knowing factors and multiples of numbers can help in estimating products and quantities. Place value is used to multiply and divide multi-digit numbers. Estimation can be used to check the reasonableness of an answer. Division is the inverse of multiplication.	What is a factor? What is a multiple? How are factors and multiples related? When would it be useful to multiply than to use repeated addition? When will you use division in your daily life? How are multiplication and division related?

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know:
- Ten thousand
- Hundred thousand
- Standard form, word form, expanded form
- Reasonable estimate
- Front-end estimation
- Rounding
- Product, quotient
- Factor, common factor
- Greatest common factor (GCF)
- Prime number, composite number
- Multiple, common multiple
- Least common multiple (LCM)
- Round, estimate
- Product
- Regroup
- Quotient, remainder

Students will be able to:
- Write numbers to 100,000 in standard form, word form, and expanded form.
- Compare and order numbers to 100,000.
- Identify how much more or less one number is than another number.
- Find the rule in a number pattern.
- Add multi-digit numbers with and without regrouping.
- Subtract multi-digit numbers with and without regrouping.
- Round numbers to estimate sums, differences, products, and quotients.
- Estimate to check that an answer is reasonable.
- Decide whether an exact answer or an estimate is needed.
- Find the common factors and greatest common factor of two whole numbers.
- Identify prime numbers and composite numbers.
- Find multiples of whole numbers.
- Find common multiples and the least common multiple of two or more numbers.
- Multiply multi-digit numbers by o one-digit number using an array model.
- Use different methods to multiply up to four-digit numbers by one-digit numbers, with or without regrouping.
- Multiply two two-digit numbers using an area model.
- Multiply by two-digit numbers with and without regrouping.
- Estimate products.
- Model regrouping in division.
- Divide a three-digit number by a one-digit number with regrouping.
- Divide up to a four-digit number by a one-digit number with regrouping, and with and without remainders.
- Estimate quotients.
- Solve real-world problems.

	● Solve multi-step word problems using the four operations. ● Represent the problems with a letter standing for the unknown quantity.

Suggested Resources/Technology Tools

Math In Focus Resources Chapter 1: Place Value of Whole Numbers
Focus Lesson: 1.2a Addition of Multi-Digit Numbers (After Lesson 2) (4.NBT.4) TEA 276A
Focus Lesson: 1.2b Subtraction of Multi-Digit Numbers (After Lesson 2.a) (4.NBT.4) TEA 276B
Math In Focus Resources Chapter 2: Estimation and Number Theory
Focus Lesson: 3.0.a Multiply Using Arrays (Before Ch 3 Lesson 1) (4.NBT.5) TEA 276D
Math In Focus Resources Chapter 3: Whole Number Multiplication and Division
Focus Lesson: 3.1.a Multiply Using Area Models (After Lesson 1) (4.NBT.5) TEA 276E
Focus Lesson: 3.5.a Multiplication and Division: Real World Problems (After Lesson 5) (4.OA.2, 4.OA.3) TEA 276F

Place-value chart
Place-value chips
Number cards
Prime numbers table
Number cubes
Base-ten blocks
Place-value chart
Place-value chips
Calendar

Math In Focus Virtual Manipulatives

Sea Squares by Joy N. Hulme
Each Orange had 8 Slice: A Counting Book by Paul Giganti

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice workbook pages, anchor charts, scaffolded explanations of topics, manipulatives, additional time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
    A Word Wall which includes terms, definitions, and examples

Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment workbook, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

Please select all standards that apply to this unit of study:
- ❏ Act as a responsible and contributing citizen and employee.
- ❏ Apply appropriate academic and technical skills.
- ❏ Attend to personal health and financial well being.
- ❏ Communicate clearly and effectively and with reason.
- ❏ Consider the environmental social and economics impacts of decisions.
- ❏ Demonstrate creativity and innovation.
- ❏ Employ valid and reliable research strategies.
- ❏ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❏ Model integrity, ethical leadership, and effective management.
- ❏ Plan education and career paths aligned to personal goals.
- ❏ Use technology to enhance productivity.
- ❏ Work productively in teams while using cultural global competence.

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 2
Fractions and Mixed Numbers
Summary and Rationale
Students learn how to add and subtract like fractions with and without renaming. They are introduced to the concept of fractions of a set, and will apply this knowledge to solve real-world problems. Terms such as numerator and denominator are used throughout this unit. Fraction circles and bar models are used to illustrate the concepts. Students apply their knowledge if finding common factors and multiples to add and subtract unlike but related fractions
Recommended Pacing

Standards	
Number and Operations-Fractions	
4.NF.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.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 ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.
4.NF.3	Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
4.NF.3a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.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. *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.*
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.3d	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.4a	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 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*
4.NF.4b	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 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*
4.NF.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 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?*
Operations and Algebraic Thinking	
4.OA.2	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

4.OA.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.

Measurement & Data

4.MD.4	Make a line plot to display a data set of measurements in fractions of a unit (½, ¼, ⅛). Solve problems involving addition and subtraction of fractions by using information presented in line plots.

Mathematical Practices

K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP.3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.6	Attend to precision.
K-12.MP.7	Look for and make use of structure.

Interdisciplinary Connections

Standard x.x	

Integration of Technology

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Fractions and mixed numbers are used to name whole and parts of a whole. Fractions and mixed numbers can be added and subtracted. To add or subtract unlike fractions, find a common multiple of both denominators and use that as the denominator of both fractions.	How is an improper fraction converted into a mixed number? How do you add or subtract like fractions and mixed numbers?

Objectives (SLO)

Students will know:	Students will be able to:
- Numerator, denominator - Equivalent fraction - Unlike fraction - Mixed number - Simplest form - Improper fraction - Fraction bar - Division rule - Multiplication rule . .	- Compare unlike fractions using the symbols >, =, or < . - Find equivalent fractions. - Add and subtract unlike fractions. - Write a mixed number for a model. - Draw models to represent mixed numbers. - Write an improper fraction for a model. - Express mixed numbers as improper fractions. - Use multiplication and division to rename improper fractions and mixed numbers. - Add fractions to get mixed-number sums. - Subtract fractions from whole numbers. - Use a bar model to represent a fraction of a set. - Find a fractional part of a number. - Multiply a fraction and a whole number. - Solve real-world problems involving fractions. - Show measurements in a line plot with a scale of fractions of a unit. - Solve problems by adding and subtracting fractions from data in a line plot.

Suggested Resources/Technology Tools

Focus Lesson: 6.0.a Comparing Unlike Fractions (Before Ch 6 Lesson 1) (4.NF.2) TEA 276H
Chapter 6 Fractions & Mixed Numbers
Add and Subtract Like Fractions Only - Can pick up unlike fractions at the end of the year
*Skip 6.1 and 6.2
Do Lessons 6.3 through 6.7 ONLY
Focus Lesson: 6.7a Multiplying Fractions and Whole Numbers (After Lesson 7) (4.NF.4.c) TEA 276I
Lesson 6.8
Focus Lesson: 6.8a Line Plots with Fractions of a Unit (After Lesson 8) (4.MD4.) TEA 276J

Fraction strips
Fraction circles
Fraction bar models
Number cubes
Connecting cubes

Math In Focus Virtual Manipulatives

Top 10 of Everything: 200 by R. Ash
Scholastic Kid's Almanac for the 21st Century by E. Pascoe and D. Kops

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice workbook pages, anchor charts, scaffolded explanations of topics, manipulatives, additional time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
    A Word Wall which includes terms, definitions, and examples
    Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment workbook, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work
        Learning Extension: Adding and Subtracting Unlike Fractions (6.1 and 6.2)

Please select all standards that apply to this unit of study:
    ❏ Act as a responsible and contributing citizen and employee.
    ❏ Apply appropriate academic and technical skills.
    ❏ Attend to personal health and financial well being.
    ❏ Communicate clearly and effectively and with reason.
    ❏ Consider the environmental social and economics impacts of decisions.
    ❏ Demonstrate creativity and innovation.
    ❏ Employ valid and reliable research strategies.
    ❏ Utilize critical thinking to make sense of problems and persevere in solving them.
    ❏ Model integrity, ethical leadership, and effective management.
    ❏ Plan education and career paths aligned to personal goals.
    ❏ Use technology to enhance productivity.
    ❏ Work productively in teams while using cultural global competence.

 Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 3
Decimals
Summary and Rationale
Decimals are an extension of the base-ten system of writing whole numbers. Decimals can represent amounts that are parts of a whole and are useful for representing numbers less than one and numbers between consecutive whole numbers. In this unit, students learn to recognize, compare, and round decimals in tenths and hundredths. Number lines are used to represent, compare, and round decimals. Students learn that the period used to separate dollars and cents in money is called a decimal point, which is used to separate the whole number part and the fractional part. Students make the connection between equivalent fractions and decimals through models and number lines. Students add and subtract decimals by using the same algorithms as whole numbers.
Recommended Pacing
Standards

Number and Operations in Base Ten

4.NBT.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.
4.NBT.3	Use place value understanding to round multi-digit whole numbers to any place.
4.NBT.4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Number and Operations-Fractions

4.NF.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.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 ½. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
4.NF.3	Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
4.NF.3a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
4.NF.5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.2 For example, express 3/10 as 30/100, and add $3/10 + 4/100 = 34/100$.
4.NF.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
4.NF.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.
4.NF.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
4.NF.4a	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 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*
4.NF.4b	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 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*
4.NF.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 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?*
Operations and Algebraic Thinking	
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
4.OA.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" to 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.*

Measurement & Data	
4.MD.1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *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.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.
Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP.3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.6	Attend to precision.
K-12.MP.7	Look for and make use of structure.
K-12.MP.8	Look for and express regularity in repeated reasoning.
Interdisciplinary Connections	
Standard x.x	
Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Decimals are another way to show amounts that are parts of a whole.	How are decimals and fractions related? What is the significance of the decimal point?

Decimals are useful for representing numbers less than one and numbers between consecutive whole numbers. A decimal has a decimal point to the right of the ones place and digits to the right of the decimal point. The decimal point is used to separate the whole number part and the fractional part. Decimals can be added and subtracted in the same ways as whole numbers.	How are decimals added and subtracted?

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know: ● Tenth, hundredth ● Decimal form ● Decimal point ● Expanded form ● Placeholder zero ● Equivalent fraction and decimal	Students will be able to: ● Read and write tenths in decimal and fractional forms ● Represent and interpret tenths models. ● Read and write hundredths in decimal and fractional forms ● Represent and interpret hundredths models. ● Compare and order decimals. ● Complete number patterns. ● Round decimals to the nearest whole number or tenth. ● Express a fraction as a decimal and a decimal as a fraction. ● Add and subtract decimals up to two decimal places. ● Solve real-world problems involving addition and subtraction of decimals.

Suggested Resources/Technology Tools

Math In Focus Resources Chapter 7: Decimals
Math In Focus Resources Chapter 8: Adding and Subtracting Decimals
Decimal place-value chart
Place-value chips
Centimeter ruler
Ten-sided dice
Measuring tape
Decimal cards
Fraction cards
Decimal bars
Unit cubes

Decimal squares in tenths and hundredths

Math In Focus Virtual Manipulatives

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice workbook pages, anchor charts, scaffolded explanations of topics, manipulatives, additional time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
    A Word Wall which includes terms, definitions, and examples
    Drawings and numbers to show examples of terms

Gifted and Talented - Enrichment workbook, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

Extension Topics:
Adding and Subtracting Decimals (Chapter 8)- in preparation for Grade 5

Please select all standards that apply to this unit of study:
- ❏ Act as a responsible and contributing citizen and employee.
- ❏ Apply appropriate academic and technical skills.
- ❏ Attend to personal health and financial well being.
- ❏ Communicate clearly and effectively and with reason.
- ❏ Consider the environmental social and economics impacts of decisions.
- ❏ Demonstrate creativity and innovation.
- ❏ Employ valid and reliable research strategies.
- ❏ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❏ Model integrity, ethical leadership, and effective management.
- ❏ Plan education and career paths aligned to personal goals.
- ❏ Use technology to enhance productivity.
- ❏ Work productively in teams while using cultural global competence.

 Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 4
Geometric Measurement
Summary and Rationale

In this unit, students identify and relate angles, perpendicular lines, and parallel lines to real-life objects and are encouraged to see angles and lines in planes shapes and three-dimensional objects. Students learn that angles can be seen everywhere around them. Angles are formed when two rays or sides of a figure meet. Students estimate angle measures, measure angles with a protractor, and are introduced to the degree symbol. They also learn to draw angles to 180° using a protractor and make connections between angles and turns.

Students extend their knowledge of lines to line segments and continue to explore parallel and perpendicular lines. They learn to use a drawing triangle to draw perpendicular, parallel, horizontal, and vertical line segments when a grid is not provided.

Students learn the properties of squares and rectangles. They apply their knowledge of angles and parallel and perpendicular line segments to identify and define squares and rectangles. Students also decompose shapes that are made up of squares and rectangles. These use the properties of squares and rectangles to find unknown angles measures and side lengths of figures.

Students learn the concept of symmetry, as well as how check for congruency, determine symmetric figures, and draw a line of symmetry to produce congruent halves and symmetric figures.

Students learn to find the area and perimeter of figures using formulas. They find the perimeter of composite figures. Students apply the properties of squares and rectangles to find one side of a square or rectangle given its perimeter or area. They also solve real-world problems involving area and perimeter of figures.

Recommended Pacing

Standards
Geometry

4.G.1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

4.G.2	Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.
4.G.3	Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Measurement & Data	
4.MD.3	Appy 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 teh flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*
4.MD.5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:
4.MD.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 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.
4.MD.5b	An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
4.MD.6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
4.MD.7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Operations and Algebraic Thinking	
4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Mathematical Practices	
K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP.3	Construct viable arguments and critique the reasoning of others.
K-12.MP.4	Model with mathematics.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.

K-12.MP.7	Look for and make use of structure.

Interdisciplinary Connections	
Standard x.x	

Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Angles can be seen and measured when two rays or sides of a shape meet.	How is an angle formed?
	How are angles measured?
Line segments can go up and down, from side to side, and in every direction.	
	How are parallel and perpendicular line segments different?
Parallel lines never intersect.	How are vertical and horizontal lines related?
Perpendicular lines intersect at right angles.	Are all squares also classified as rectangles?
A horizontal line is one that is parallel to the level around. A vertical line is one that is perpendicular to a horizontal line.	Area all rectangles also classified as squares?
	What is line symmetry?
Squares and rectangles are four- sided figures with special properties.	Which figures have line symmetry?
	What is area?
A square has four sides of equal length and four right angles. The opposite sides are parallel.	What is perimeter?
A rectangle has four sides and four right angles. The opposite sides are parallel and have the same length.	What are the formulas for area and perimeter?
	How are perimeter and area related? How are they different?
A square is a subset of a rectangle. All squares are rectangles, but not all rectangles are squares.	
Figures can have line symmetry.	

Area and perimeter of a square, rectangle, or composite figure can be found by counting squares or using a formula. The area formula for any rectangle is length x width. Area is the amount of surface covered by a figure and is measured in square units. Area can be measured by counting the number of same-sized units of area that cover the shape without gaps overlaps. Perimeter is the distance around a figure.	

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know:	Students will be able to:
- Ray - Vertex - Protractor - Degrees - Inner scale, outer scale - Acute angle - Obtuse angle - Right angle - Straight angle - Turn - Additive - Perpendicular lines and line segments - Drawing triangle - Parallel lines and line segments - Base - Horizontal lines, vertical lines - Square - Rectangle - Length - Width - Composite figure - Line of symmetry - Symmetric figure - Rectangle	- Make a right angle and compare angles to right angles. - Identify right angles in plane shapes. - Define and identify perpendicular lines. - Define and identify parallel lines. - Estimate and measure angles with a protractor. - Estimate whether the measure of an angle is less than or greater than a right angle (90°). - Use a protractor to draw acute and obtuse angles. - Relate ¼, ½, ¾, and full turns to the number of right angles (90°). - Understand that an angle that turns through 1/360 of a circle is called a "one-degree angle." - Find unknown angles using addition or subtraction. - Solve addition and subtraction problems to find unknown angles on a diagram in real-world problems. - Draw perpendicular line segments. - Draw parallel line segments. - Identify vertical and horizontal lines. - Understand and apply properties of squares and rectangles. - Find unknown angle measures and side lengths of squares and rectangles. - Identify a line of symmetry of a figure. - Draw a shape or pattern about a line of symmetry.

● Length ● Width ● Area formula ● Perimeter formula	● Complete a symmetric shape or pattern. ● Create symmetric patterns on grid paper. ● Estimate the area of a rectangle using grid squares. ● Find the area of a rectangle using a formula. ● Solve problems involving the area and perimeter of squares and rectangles. ● Find the perimeter and area of a composite figure. ● Solve word problems involving estimating areas of figures. ● Solve word problems involving area and perimeter of composite figures.

Suggested Resources/Technology Tools

Math in Focus Resources Grade 3 Chapter 17 Angles and Lines (17.2 to 17.4)
Math in Focus Resources Chapter 9: Angles
Focus Lesson: 9.3a Understanding Angle Measurement (After Lesson 3) (4.MD.5.a) TEB 242A
Focus Lesson: 9.3.d Understanding Angle Measure is Additive (After Lesson 3.a) (4.MD.7) TEB 242B
Math in Focus Resources Chapter 10: Perpendicular and Parallel Lines
Math in Focus Resources Chapter 11: Squares and Rectangles
Math in Focus Resources Grade 3 Chapter 18 Two-Dimensional Shapes (18.3-Symmetry)
Math in Focus Resources Chapter 13: Symmetry (13.1 only)
Math in Focus Resources Chapter 12: Area and Perimeter
www.mathleague.com/help/geometry/angles.htm (Angle notes)
www.mathplayground.com/measuringangles.html (Using a protractor)
www.math-play.com/Polygon-Game.html (Polygons)
www.mrnussbaum.com/shapeinvaders.htm (Polygon and shapes games)

Protractors
Table for Measuring angles
Angle strips
Straightedge
Drawing triangle
Centimeter ruler
Centimeter grid paper
Geoboards
Dot paper
Shape cut-outs

Math In Focus Virtual Manipulatives

The Greedy Triangle by Marilyn Burns
Math Curse by Jon Scieska

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice workbook pages, anchor charts, scaffolded explanations of topics, manipulatives, additional time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
    A Word Wall which includes terms, definitions, and examples
    Drawings and numbers to show examples of terms

504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

Gifted and Talented - Enrichment workbook, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work

Extension Topics:
Rotational Symmetry (Chapter 13- Lesson 13.3)
Tessellations (Chapter 14)
www.coolmath4kids.com/tesspag1.html (Tessellations notes)

Please select all standards that apply to this unit of study:
- ❏ Act as a responsible and contributing citizen and employee.
- ❏ Apply appropriate academic and technical skills.
- ❏ Attend to personal health and financial well being.
- ❏ Communicate clearly and effectively and with reason.
- ❏ Consider the environmental social and economics impacts of decisions.
- ❏ Demonstrate creativity and innovation.
- ❏ Employ valid and reliable research strategies.
- ❏ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❏ Model integrity, ethical leadership, and effective management.
- ❏ Plan education and career paths aligned to personal goals.
- ❏ Use technology to enhance productivity.
- ❏ Work productively in teams while using cultural global competence.

 Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS:

Unit 5

Measurement & Data

Summary and Rationale

In this unit, students measure length, weight, and capacity using customary units. With the exposure to real-world problems, students are able to make sense of what they learn in parallel context situations encountered in everyday life.

Recommended Pacing

Tables and graphs are the visual tools for showing and analyzing data. Data that is tabulated or plotted on graphs can be reviewed easily, and visually elicit patterns and trends. Comparing, analyzing, and classifying are just some of the thinking skills students apply as they look for these patterns and trends. Students are introduced to line graphs, which are graphs with two numerical axes and shows data continuously from left to right. Students use the four operations of whole numbers when they analyze data presented in graphs and tables to solve problems. Students learn how to use different tools to analyze data such as average, mean, and median. They apply their understanding of place value and graphs to develop and use stem-and-leaf plots.

Standards

Measurement & Data

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

Operations and Algebraic Thinking

4.OA.3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Mathematical Practices

K-12.MP.1	Make sense of problems and persevere in solving them.
K-12.MP.2	Reason abstractly and quantitatively.
K-12.MP.3	Construct viable arguments and critique the reasoning of others.

K-12.MP.4	Model with mathematics.
K-12.MP.5	Use appropriate tools strategically.
K-12.MP.6	Attend to precision.
K-12.MP.7	Look for and make use of structure.

Interdisciplinary Connections	
Standard x.x	
Integration of Technology	

Instructional Focus

Enduring Understandings:	**Essential Questions:**
Length, weight, and capacity can be measured using customary units.	When and how do we measure length?
Length can be measured in inches, feet, yards, and miles.	When and how do we measure weight?
Weight can be measured in ounces, pounds, and tons.	Where do we find units of capacity such as cups, pints, quarts, or gallons?
Capacity can be measured in cups, pints, quarts, and gallons.	How does organizing data make it easier to understand?
Graphs and tables are visual tools for showing and analyzing data.	How is data on a line plot interpreted?
Information can be analyzed to find a typical value for a data set.	How is data on a stem-and-leaf interpreted?
Line graphs have two numerical axes and show data continuously from left to right.	

Evidence of Learning (Assessments)

Objectives (SLO)

Students will know:	Students will be able to:
- Inch (in.), half-inch, foot (ft), yard (yd), mile (mi) - Ounce (oz), pound (lb), ton (T) - Cup (c), pint (pt), quart (qt), gallon (gal) - Data - Table - Tally chart - Row, column, intersection, - Line graph - Horizontal axis, vertical axis - Average, mean - Median - Mode - Range - Line plot - Stem-and-leaf plot - Outlier	- Use inch, foot, yard, and mile as units of measurement for lengths. - Estimate and measure given lengths. - Use referents to measure lengths. - Use ounce, pound, and ton as units of measurement for weight. - Read scales in ounce (oz) and pound (lb). - Understand the relative sizes of measurement units. - Convert metric units of length. - Convert customary units of length. - Convert metric units of mass. - Convert customary units of weight. - Convert units of time. - Use the four operations to solve word problems involving distance, time, volume, mass, and money. - Represent measurement quantities using line diagrams. - Estimate and find actual weights of objects by using different scales. - Use referents to measure weight. - Measure capacity with cup (c), pint (pt), quart, (qt), and gallon (gal). - Estimate and find the actual capacity of a container. - Relate units of capacity to one another. - Collect, organize, and interpret data in a table. - Create a table form data in a tally chart and a bar graph. - Read and interpret data in a table, using rows, columns, and intersections. - Make, read, and interpret line graphs. - Choose an appropriate graph to display a given data set. - Describe a data set using the average or mean. - Find the mean, median, mode, and range of a set of data. - Make an interpret line plots. - Organize and represent data in a stem-and-leaf plot. - Use a stem-and-leaf plot to find median, mode, and range.

Suggested Resources/Technology Tools

Focus Lesson: 12.0.a Measurement: Length (4.MD.1) TEB 242D
Grade 3 Chapter 15- Lessons 15.2 and 15.3 Measuring Weight and Capacity
Focus Lesson: 12.0.b Measurement: Mass and Weight (4.MD.1) TEB 242G
Focus Lesson: 12.0.c Measurement: Time (4.MD.1) TEB 242I
Focus Lesson: 12.0.d Real World Problems: Measurement (4.MD.2) TEB 242K
Math in Focus Resources Grade 4 Chapter 4: Tables and Line Graphs

Tally charts
Survey tables
Grid paper
Connecting cubes
Counters
Line plots

Math In Focus Virtual Manipulatives

www.gamequarium.com/data.html (Landmarks games: Range, mode, median)
www.shodor.org/interactivate/activities/StemAndLeafPlotter/ (Stem-and-leaf)

How Much is a Million? by David Schwartz
If You Made a Million by David Schwartz

Modifications

*These are only suggested ideas to modify instruction, modifications and accommodations should be tailored to each student's IEP and needs. Also, see textbook for Differentiated Instruction ideas in each chapter.

Special Education - Reteach/Extra practice workbook pages, anchor charts, scaffolded explanations of topics, manipulatives, additional time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention
ELL - Select activities which reinforce chapter vocabulary and connections among these words such as:
    A Word Wall which includes terms, definitions, and examples
    Drawings and numbers to show examples of terms
Gifted and Talented - Enrichment workbook, Put on Your Thinking Cap pages and resources, higher-level questions, challenge packets, KenKen and other puzzles, leading group work
504 - Reteach/Extra practice pages, anchor charts, scaffolded explanations of topics, manipulatives, extra time for work, group work, visual aids, modeling, hands-on learning activities, small group work for more individualized attention

Please select all standards that apply to this unit of study:
- ❏ Act as a responsible and contributing citizen and employee.
- ❏ Apply appropriate academic and technical skills.
- ❏ Attend to personal health and financial well being.
- ❏ Communicate clearly and effectively and with reason.

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

Suggestions on integrating these standards can be found at: http://www.state.nj.us/education/cccs/2014/career/9.pdf

LINKS TO CAREERS: