



Mathematics 4

Diocese of Greensburg Curriculum

Unit	Standards	Content	Skills
<p>Understanding Whole Numbers and Operations</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Number & Operations in Base Ten</p> <p>4.NBT.A. Generalize place value understanding for multi-digit whole numbers.</p> <p>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.</p> <p>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.</p> <p>4.NBT.A.3. Use place value understanding to round multi-digit whole numbers to any place.</p> <p>4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic.</p> <p>4.NBT.B.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.</p> <p>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.</p> <p>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</p>	<ul style="list-style-type: none">• Place Value to Millions• Standard, Expanded, and Word Form• Comparing and Ordering Whole Numbers• Addition and Subtraction of Whole Numbers• Use of Variables in equations and expressions• Numerical patterns• Subtracting Across Zero• Properties of Addition and Subtraction• Rounding and Estimation of Whole Numbers• Regrouping	<p>The student will be able to:</p> <p>Knowledge</p> <ul style="list-style-type: none">• Read, write and understand place value through the hundred millions• Write numbers in expanded form and word form <p>Comprehension</p> <ul style="list-style-type: none">• Compare and order numbers <p>Application</p> <ul style="list-style-type: none">• Write and solve addition or subtraction problems with a variable• Add and subtract whole numbers and money amounts• Use subtraction rules for zero• Understand and use the properties of addition and subtraction• Add and subtract whole numbers and money with regrouping• Write expressions using variables• Solve expression using variables

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	<p>explain the calculation by using equations, rectangular arrays, and/or area models.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Number & Operations Understand numbers, ways of representing numbers, relationships among numbers, and number systems</p> <p>understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals;</p> <p>recognize equivalent representations for the same number and generate them by decomposing and composing numbers;</p> <p>Compute fluently and make reasonable estimates</p> <p>develop fluency in adding, subtracting, multiplying, and dividing whole numbers;</p> <p>develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results;</p> <p>select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools</p> <p>Algebra Represent and analyze mathematical situations and structures using algebraic symbols</p> <p>identify such properties as commutativity, associativity, and distributivity and use them to compute with whole numbers;</p> <p>represent the idea of a variable as an unknown quantity using a letter or a symbol;</p> <p>express mathematical relationships using equations.</p>		<ul style="list-style-type: none"> Identify and complete number patterns <p>Synthesis</p> <ul style="list-style-type: none"> Recognize and estimate when an estimate is appropriate

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	<p>Use mathematical models to represent and understand quantitative relationships</p> <p>model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.</p> <p>Process Standards</p> <p>Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p> <p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>Reasoning and Proof</p> <p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Select and use various types of reasoning and methods of proof</p> <p>Communication</p> <p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p>		

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	<p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p> <p>Representation</p> <p>Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Multiplication</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Operations & Algebraic Thinking 4.OA.A. Use the four operations with whole numbers to solve problems.</p> <p>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.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Number & Operations Understand meanings of operations and how they relate to one another</p> <p>understand various meanings of multiplication and division;</p> <p>understand the effects of multiplying and dividing whole numbers;</p>	<ul style="list-style-type: none"> • Properties of Multiplication • Order of Operations • Multiplication Facts to 12 • Multiplication with Regrouping (1 digit by 2digit, 2 digit by 2 digit, 2 digit by 5 digit) • Variables in equations and expressions • Multiplication of Money • Problem Solving Strategies • Prime and Composite Numbers • Review Fact Families • Multiplying by 10s, 100s and 1,000s • Estimates 	<p>Knowledge</p> <ul style="list-style-type: none"> • Understand and apply the properties of multiplication <p>Comprehension</p> <ul style="list-style-type: none"> • Recall multiplication facts to 12 <p>Application</p> <ul style="list-style-type: none"> • Multiply with regrouping • Solve multiplication problems with variables • Multiply money amounts • Solve problems using a variety of strategies • Multiply mentally by 10s, 100s, 1,000s • Estimate products

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	<p>identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems;</p> <p>understand and use properties of operations, such as the distributivity of multiplication over addition.</p> <p>Compute fluently and make reasonable estimates</p> <p>develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 3050</p> <p>develop fluency in adding, subtracting, multiplying, and dividing whole numbers;</p> <p>develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results;</p> <p>select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools</p> <p>Process Standards</p> <p>Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p> <p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>Reasoning and Proof</p> <p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Communication</p>		<p>Analysis</p> <ul style="list-style-type: none"> • Classify prime and composite numbers <p>Synthesis</p> <ul style="list-style-type: none"> • Create multiplication word problems <p>Evaluation</p> <ul style="list-style-type: none"> • Justify answer • Prove that the solution is reasonable

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	<p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p> <p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p> <p>Representation</p> <p>Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Division</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Number & Operations in Base Ten 4.NBT.B. Use place value understanding and properties of operations to perform multi-digit arithmetic.</p>	<ul style="list-style-type: none"> • Divisibility Rules 2, 3, 5 and 10 • Properties of Division • Represent unknowns with variables • Division with 1, 2, and 3 digit quotients with or without remainders 	<p>The students will be able to:</p> <p>Knowledge</p> <ul style="list-style-type: none"> • Understand the meanings of division and the rules of division

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	<p>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.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Number & Operations Understand numbers, ways of representing numbers, relationships among numbers, and number systems</p> <p>develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers;</p> <p>Understand meanings of operations and how they relate to one another</p> <p>understand various meanings of multiplication and division;</p> <p>understand the effects of multiplying and dividing whole numbers;</p> <p>identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems;</p> <p>understand and use properties of operations, such as the distributivity of multiplication over addition.</p> <p>Compute fluently and make reasonable estimates</p> <p>develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 3050</p> <p>develop fluency in adding, subtracting, multiplying, and dividing whole numbers;</p>	<ul style="list-style-type: none"> • Division with 1 digit divisors • Division with Money • Problem Solving Strategies • Relationships among fact families • Zeros in Quotients • Order of Operations • Divide by 10s, 100s, 1,000s • Estimate quotients 	<ul style="list-style-type: none"> • Find missing dividend and divisors <p>Comprehension</p> <ul style="list-style-type: none"> • Demonstrate using the rules for order of operations <p>Application</p> <ul style="list-style-type: none"> • Divide to get 1, 2, and 3 digit quotients with and without remainders • Divide amounts of money by 1 digit divisors • Divide by 10s, 100s, 1,000s • Estimate quotients <p>Analysis</p> <ul style="list-style-type: none"> • How is division related to multiplication <p>Synthesis</p> <ul style="list-style-type: none"> • Solve problems using a variety of strategies <p>Evaluation</p> <ul style="list-style-type: none"> • Justify answer • Prove that the solution is reasonable

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	<p>develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results;</p> <p>select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools</p> <p>Process Standards</p> <p>Reasoning and Proof</p> <p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Make and investigate mathematical conjectures</p> <p>Develop and evaluate mathematical arguments and proofs</p> <p>Select and use various types of reasoning and methods of proof</p> <p>Communication</p> <p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p> <p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p>		

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	<p>Representation</p> <p>Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Geometry</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Geometry 4.G.A. Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Geometry Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop</p>	<ul style="list-style-type: none"> • Lines • Line Segments • Rays • Angles-acute, obtuse, right and straight • Polygons • Quadrilaterals • Circles • Parallel and Perpendicular Lines • Perimeter of squares, rectangles and triangles • Area (Square and rectangle) • Volume • Solid Figures • Symmetry • Transformation of figures • Protractor use • Coordinate grid 	<p>The students will be able to:</p> <p>Knowledge</p> <ul style="list-style-type: none"> • Identify, name and draw points, lines and line segments • Identify and name rays, angles and parts of an angle • Identify, name and classify quadrilaterals • Identify and name a circle and its parts • Identify solid figures • Identify figures as similar or congruent • Identify and name polygons • Define and identify circumference and radius of a circle • Classify triangles based on length of sides and angles <p>Application</p>

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	<p>mathematical arguments about geometric relationships</p> <p>identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes;</p> <p>classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids;</p> <p>investigate, describe, and reason about the results of subdividing, combining, and transforming shapes;</p> <p>explore congruence and similarity;</p> <p>make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions.</p> <p>Specify locations and describe spatial relationships using coordinate geometry and other representational systems</p> <p>describe location and movement using common language and geometric vocabulary;</p> <p>make and use coordinate systems to specify locations and to describe paths;</p> <p>find the distance between points along horizontal and vertical lines of a coordinate system.</p> <p>Apply transformations and use symmetry to analyze mathematical situations</p> <p>predict and describe the results of sliding, flipping, and turning two-dimensional shapes;</p> <p>describe a motion or a series of motions that will show that two shapes are congruent;</p> <p>identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs.</p> <p>Use visualization, spatial reasoning, and geometric modeling to solve problems</p>		<ul style="list-style-type: none"> • Determine if an angle is acute, obtuse, right or straight • Use formulas to find perimeter and area of squares and rectangles • Use formula to find the volume of a rectangular solid • Draw and measure angles using a protractor • Label points on a graph using coordinate pairs • Calculate missing angles <p>Analysis</p> <ul style="list-style-type: none"> • Classify sets of lines as intersecting, perpendicular or parallel • Translation, rotation, and reflection (slides, turns, flips) • Synthesis • Graph, locate and identify points using ordered pairs of numbers <p>Evaluation</p> <ul style="list-style-type: none"> • Justify answer • Prove that the solution is reasonable

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	<p>build and draw geometric objects;</p> <p>create and describe mental images of objects, patterns, and paths;</p> <p>identify and build a three-dimensional object from two-dimensional representations of that object;</p> <p>identify and draw a two-dimensional representation of a three-dimensional object;</p> <p>use geometric models to solve problems in other areas of mathematics, such as number and measurement;</p> <p>recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.</p> <p>Measurement</p> <p>Understand measurable attributes of objects and the units, systems, and processes of measurement</p> <p>understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute;</p> <p>explore what happens to measurements of a two-dimensional shape such as its perimeter and area when the shape is changed in some way.</p> <p>Apply appropriate techniques, tools, and formulas to determine measurements</p> <p>develop strategies for estimating the perimeters, areas, and volumes of irregular shapes;</p> <p>select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;</p> <p>develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms;</p>		

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	<p>develop strategies to determine the surface areas and volumes of rectangular solids.</p> <p>Process Standards</p> <p>Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p> <p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>Reasoning and Proof</p> <p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Make and investigate mathematical conjectures</p> <p>Develop and evaluate mathematical arguments and proofs</p> <p>Select and use various types of reasoning and methods of proof</p> <p>Communication</p> <p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p>		

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	<p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p> <p>Representation</p> <p>Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Fractions</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Number & Operations—Fractions 4.NF.A. Extend understanding of fraction equivalence and ordering.</p> <p>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.</p> <p>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</p>	<ul style="list-style-type: none"> • Reading and Writing Fractions (modeling, understanding and representing fractions) • Equivalent Fractions • Compare and Order Fractions • Factors and Multiples • Reducing Fractions to Simplest Form • LCM and GCF • Numerical operations with fractions (like and unlike denominators) • Mixed Numbers • Improper Fractions • Prime and composite numbers • unit/benchmark fractions 	<p>The students will be able to:</p> <p>Knowledge</p> <ul style="list-style-type: none"> • Identify equivalent fractions • Recognize the numerator and denominator of a fraction • Find common factors and multiples • Find fractional parts of a number • Identify a unit fraction (benchmark fraction) <p>Comprehension</p> <ul style="list-style-type: none"> • Compare and order fractions • Rename improper fractions as whole numbers or mixed

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	<p>4.NF.B. Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.</p> <p>4.NF.B.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.</p> <p>4.NF.B.3a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.</p> <p>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.</p> <p>4.NF.B.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.</p> <p>4.NF.B.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.</p> <p>4.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <p>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.</p> <p>4.NF.C. Understand decimal notation for fractions, and compare decimal fractions.</p> <p>4.NF.C.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use</p>		<p>numbers in simplest form/ rename mixed numbers as improper fractions</p> <p>Application</p> <ul style="list-style-type: none"> • Add and subtract fractions with like denominators • Add and subtract fractions with unlike denominators • Read and write mixed numbers • Write whole numbers as a fraction • Review prime and composite numbers <p>Analysis</p> <ul style="list-style-type: none"> • Reduce fractions to simplest form <p>Synthesis</p> <ul style="list-style-type: none"> • Solve problems using a variety of strategies <p>Evaluation</p> <ul style="list-style-type: none"> • Justify answer • Prove that the solution is reasonable • Estimate fractions closer to zero, half or one

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	<p>this technique to add two fractions with respective denominators 10 and 100.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Number & Operations Understand numbers, ways of representing numbers, relationships among numbers, and number systems</p> <p>develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers;</p> <p>use models, benchmarks, and equivalent forms to judge the size of fractions;</p> <p>recognize and generate equivalent forms of commonly used fractions, decimals, and percents;</p> <p>describe classes of numbers according to characteristics such as the nature of their factors.</p> <p>Compute fluently and make reasonable estimates</p> <p>develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience;</p> <p>use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals;</p> <p>select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools</p> <p>Process Standards Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p>		

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	<p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>Reasoning and Proof</p> <p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Make and investigate mathematical conjectures</p> <p>Develop and evaluate mathematical arguments and proofs</p> <p>Select and use various types of reasoning and methods of proof</p> <p>Communication</p> <p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p> <p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p> <p>Representation</p>		

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	<p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Decimals</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Number & Operations—Fractions 4.NF.C. Understand decimal notation for fractions, and compare decimal fractions.</p> <p>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.</p> <p>4.NF.C.6. Use decimal notation for fractions with denominators 10 or 100</p> <p>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</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Number & Operations Understand numbers, ways of representing numbers, relationships among numbers, and number systems</p> <p>understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals;</p>	<ul style="list-style-type: none"> • Reading and Writing Decimals to the Hundredths Place • Rounding to the Nearest Whole Number and Tenths • Adding and Subtracting Decimals • Ordering Decimals • Money and Decimals • Relationship of fractions and decimals with denominator of 10 or 100 • Decimals with number line 	<p>The students will be able to:</p> <p>Comprehension</p> <ul style="list-style-type: none"> • Compare decimals up the hundredths place • Compare and order decimals • Compare money amounts <p>Application</p> <ul style="list-style-type: none"> • Read and write decimals to tenths and hundredths • Add and subtract decimals • Round decimals to the nearest whole number and tenths • Add and subtract money values • change between fractions and decimals (10s and 100s) • Label number line with decimal <p>Synthesis</p>

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	<p>recognize and generate equivalent forms of commonly used fractions, decimals, and percents;</p> <p>Compute fluently and make reasonable estimates</p> <p>develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience;</p> <p>use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals;</p> <p>select appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the computation and use the selected method or tools</p> <p>Process Standards</p> <p>Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p> <p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>Reasoning and Proof</p> <p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Make and investigate mathematical conjectures</p> <p>Develop and evaluate mathematical arguments and proofs</p> <p>Select and use various types of reasoning and methods of proof</p> <p>Communication</p>		<ul style="list-style-type: none"> • Solve problems using a variety of strategies <p>Evaluation</p> <ul style="list-style-type: none"> • Justify answer • Prove that the solution is reasonable

Unit	Standards	Content	Skills
	<p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p> <p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p> <p>Representation</p> <p>Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Measurement</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Measurement & Data 4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p>	<p>The students will know the following terms:</p> <ul style="list-style-type: none"> • Length • Capacity • Weight 	<p>The students will be able to:</p> <p>Knowledge</p> <ul style="list-style-type: none"> • Understand relative size of measurement units (km,

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	<p>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.</p> <p>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.</p> <p>4.MD.A.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems.</p> <p>4.MD.B. Represent and interpret data.</p> <p>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.</p> <p>4.MD.C. Geometric measurement: understand concepts of angle and measure angles.</p> <p>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:</p> <p>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</p>	<ul style="list-style-type: none"> • Conversions • Units of length, capacity and weight • Elapsed Time • Temperature • Measurement tools (ruler, meter stick) • Estimate measurement 	<p>m, g , l, ml. yd, ft, in, lb, oz gal, qt, pt, c, hr, min, sec)</p> <p>Application</p> <ul style="list-style-type: none"> • Read temperature on a thermometer • Calculate elapsed time • Measure customary and metric units of length, weight, and capacity to units within the same measurement system • Read a ruler to nearest inch, $\frac{1}{2}$ inch and $\frac{1}{4}$ inch • Select appropriate tool to measure • Select appropriate unit of measurement in real-world situations <p>Synthesis</p> <ul style="list-style-type: none"> • Solve word problems involving distances, time, volume and weight <p>Evaluation</p> <ul style="list-style-type: none"> • Prove that the solution is reasonable • Estimate measurement

Unit	Standards	Content	Skills
	<p>called a "one-degree angle," and can be used to measure angles.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Measurement Understand measurable attributes of objects and the units, systems, and processes of measurement</p> <p>understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute;</p> <p>understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems</p> <p>carry out simple unit conversions, such as from centimeters to meters, within a system of measurement;</p> <p>understand that measurements are approximations and how differences in units affect precision;</p> <p>explore what happens to measurements of a two-dimensional shape such as its perimeter and area when the shape is changed in some way.</p> <p>Apply appropriate techniques, tools, and formulas to determine measurements</p> <p>develop strategies for estimating the perimeters, areas, and volumes of irregular shapes;</p> <p>select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;</p> <p>select and use benchmarks to estimate measurements;</p> <p>develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms;</p>		

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	<p>develop strategies to determine the surface areas and volumes of rectangular solids.</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		
<p>Statistics and Probability</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Measurement & Data 4.MD.B. Represent and interpret data.</p> <p>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.</p> <p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Data Analysis & Probability Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them</p> <p>design investigations to address a question and consider how data-collection methods affect the nature of the data set;</p> <p>collect data using observations, surveys, and experiments;</p> <p>represent data using tables and graphs such as line plots, bar graphs, and line graphs;</p> <p>recognize the differences in representing categorical and numerical data.</p> <p>Select and use appropriate statistical methods to analyze data</p>	<ul style="list-style-type: none"> • Bar Graphs • Line Graphs • Circle Graphs • Pictographs • Survey and Line Plot • Events and Outcomes (Probability) • Tally Chart • Mean, Median, Mode and Range 	<p>The students will be able to:</p> <p>Application</p> <ul style="list-style-type: none"> • Read and interpret bar graphs, line graphs, circle graphs, and pictographs • Interpret and make line plots • Predict the probability of an event • Identify and find the mean, median, mode and range <p>Synthesis</p> <ul style="list-style-type: none"> • Conduct a survey and show results on a line plot <p>Evaluation</p> <ul style="list-style-type: none"> • Justify answer • Prove that the solution is reasonable

Unit	Standards	Content	Skills
	<p>describe the shape and important features of a set of data and compare related data sets, with an emphasis on how the data are distributed;</p> <p>use measures of center, focusing on the median, and understand what each does and does not indicate about the data set;</p> <p>compare different representations of the same data and evaluate how well each representation shows important aspects of the data.</p> <p>Develop and evaluate inferences and predictions that are based on data</p> <p>propose and justify conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.</p> <p>Understand and apply basic concepts of probability</p> <p>describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible;</p> <p>predict the probability of outcomes of simple experiments and test the predictions;</p> <p>understand that the measure of the likelihood of an event can be represented by a number from 0 to 1.</p> <p>Process Standards</p> <p>Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p> <p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>Reasoning and Proof</p>		

Unit	Standards	Content	Skills
	<p>Recognize reasoning and proof as fundamental aspects of mathematics</p> <p>Make and investigate mathematical conjectures</p> <p>Develop and evaluate mathematical arguments and proofs</p> <p>Select and use various types of reasoning and methods of proof</p> <p>Communication</p> <p>Organize and consolidate their mathematical thinking through communication</p> <p>Communicate their mathematical thinking coherently and clearly to peers, teachers, and others</p> <p>Analyze and evaluate the mathematical thinking and strategies of others;</p> <p>Use the language of mathematics to express mathematical ideas precisely.</p> <p>Connections</p> <p>Recognize and use connections among mathematical ideas</p> <p>Understand how mathematical ideas interconnect and build on one another to produce a coherent whole</p> <p>Recognize and apply mathematics in contexts outside of mathematics</p> <p>Representation</p> <p>Create and use representations to organize, record, and communicate mathematical ideas</p> <p>Select, apply, and translate among mathematical representations to solve problems</p> <p>Use representations to model and interpret physical, social, and mathematical phenomena</p>		

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<p>Problem Solving</p>	<p>CCSS: Mathematics CCSS: Grade 4</p> <hr/> <p>Operations & Algebraic Thinking 4.OA.A. Use the four operations with whole numbers to solve problems.</p> <p>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.</p> <p>Measurement & Data 4.MD.A. Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.</p> <p>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.</p> <p>Mathematical Practice MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.</p> <p>MP.1. Make sense of problems and persevere in solving them.</p>	<p>Problem Solving Skills/Strategies</p>	<p>The students will be able to:</p> <p>Knowledge</p> <ul style="list-style-type: none"> List problem solving strategies <p>Comprehension</p> <p>Application</p> <ul style="list-style-type: none"> Apply the four operations to solve problems Determine and apply appropriate operations and strategies needed to solve given word problems <p>Analysis</p> <ul style="list-style-type: none"> Analyze word problems to identify key words, knowns and unknowns <p>Synthesis</p> <p>Evaluation</p> <ul style="list-style-type: none"> Justify answer Prove that the solution is reasonable

Unit	Standards	Content	Skills
	<p>NCTM: Mathematics NCTM: Grades 3 - 5</p> <hr/> <p>Process Standards Problem Solving</p> <p>Build new mathematical knowledge through problem solving</p> <p>Solve problems that arise in mathematics and in other contexts</p> <p>Apply and adapt a variety of appropriate strategies to solve problems</p> <p>Monitor and reflect on the process of mathematical problem solving</p> <p>© Copyright 2010. National Governors Association Center for Best Practices and Council of Chief State School Officers. All rights reserved.</p>		