Mathematics 5
Diocese of Greensburg Curriculum

Unit	Standards	Content	Skills
Understanding Numbers & Operations (Spirals)	**CCSS: Mathematics** **CCSS: Grade 5** **Operations & Algebraic Thinking** **5.OA.A. Write and interpret numerical expressions.** 5.OA.A.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols. **Number & Operations in Base Ten** **5.NBT.A. Understand the place value system.** 5.NBT.A.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. 5.NBT.A.3a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). **5.NBT.B. Perform operations with multi-digit whole numbers and with decimals to hundredths.** 5.NBT.B.5. Fluently multiply multi-digit whole numbers using the standard algorithm. 5.NBT.B.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Number & Operations—Fractions**	***Many of these concepts should spiral throughout the year*** **Place Value, Addition, Subtraction** - **Place value to billions and thousandths** - Standard, Expanded, and Word Form - Comparing and Ordering Whole Numbers - Rounding and Estimation of Whole Numbers - Properties of Addition and Subtraction - Estimation of sums and differences - Addition and subtraction of whole numbers (including 3 or more addends) - Subtraction across zero **Multiplication and Division** - Properties of multiplication and division - Divisibility Rules (2, 3, 4, 5, 6, 9, 10) - Estimation of products and quotients (including using compatible numbers and rounding) - Multiplication and division of whole numbers with multi-digits	The student will be able to: - **Write, identify, and state numbers to the billions and thousandths place.** - Write whole numbers in standard, expanded, and Word Form. - Compare and order number values. - To use and apply symbols to explain numbers. - Round and estimate number values. - Recognize and apply the properties of addition and subtraction. - Estimate sums and differences. - Add and subtract whole numbers (including 3 or more addends). - Subtract across zero. - Recognize and apply properties of multiplication and division. - Estimate products and quotients (including using compatible numbers and rounding). - Multiply and divide whole numbers with multi-digits.

Unit	Standards	Content	Skills
	5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. 5.NF.B.4a. Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. **NCTM: Mathematics** **NCTM: Grades 3 - 5** **Number & Operations** **Understand numbers, ways of representing numbers, relationships among numbers, and number systems** understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals; recognize equivalent representations for the same number and generate them by decomposing and composing numbers; **Understand meanings of operations and how they relate to one another** understand various meanings of multiplication and division; understand the effects of multiplying and dividing whole numbers; identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems; understand and use properties of operations, such as the distributivity of multiplication over addition. **Compute fluently and make reasonable estimates** develop fluency with basic number combinations for multiplication and division and use these	• Order of Operations **Algebraic Patterns and Connections** • Operational and relational symbols • Modeling with expressions and equations • Numerical patterns • Equations and inequalities	• Simplify expressions using order of operations. • Use the divisibility rules to solve problems. • Explore numerical patterns. • Solve equations and inequalities.

Unit	Standards	Content	Skills
	combinations to mentally compute related problems, such as 3050		
	develop fluency in adding, subtracting, multiplying, and dividing whole numbers;		
	develop and use strategies to estimate the results of whole-number computations and to judge the reasonableness of such results;		
	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		
	Algebra **Understand patterns, relations, and functions**		
	describe, extend, and make generalizations about geometric and numeric patterns;		
	Represent and analyze mathematical situations and structures using algebraic symbols		
	identify such properties as commutativity, associativity, and distributivity and use them to compute with whole numbers;		
	represent the idea of a variable as an unknown quantity using a letter or a symbol;		
	express mathematical relationships using equations.		
	Use mathematical models to represent and understand quantitative relationships		
	model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.		
	Process Standards **Problem Solving**		
	Build new mathematical knowledge through problem solving		

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

Unit	Standards	Content	Skills
	Select, apply, and translate among mathematical representations to solve problems Use representations to model and interpret physical, social, and mathematical phenomena 		
Decimals	**CCSS: Mathematics** **CCSS: Grade 5** **Number & Operations in Base Ten** **5.NBT.A. Understand the place value system.** 5.NBT.A.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. 5.NBT.A.3. Read, write, and compare decimals to thousandths. 5.NBT.A.3b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. 5.NBT.A.4. Use place value understanding to round decimals to any place. **5.NBT.B. Perform operations with multi-digit whole numbers and with decimals to hundredths.** 5.NBT.B.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	**Place Value, Addition, and Subtraction of Decimals** - **Reading and writing decimals to the thousandths place** - Rounding to the nearest whole number, tenths, hundredths, and thousandths - Ordering and comparing decimals - Estimation of decimal sums and differences - Addition and subtraction of decimals - Add and subtract money **Multiplication and Division of Decimals** - **Multiplication and division by 10, 100, 1000** - **Estimation of decimal products** - **Multiplication of decimals by whole numbers** - **Multiplication of decimals by decimals** - **Zeros in the product** - **Estimation of decimal quotients**	The students will be able: - **Read and write decimals to the thousandths place** - Round to the nearest whole number, tenths, hundredths, and thousandths. - Order and compare decimals. - Estimate decimal sums and differences. - Add and subtract of decimals. - Add and subtract money. The students will be able to: - **Multiply and divide by 10, 100, 1000.** - **Estimate decimal products.** - **Multiply decimals by whole numbers.** - **Multiply of decimals by decimals.** - **Calculate with zeros in the product.** - **Estimate decimal quotients.**

Unit	Standards	Content	Skills
	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.** MP.4. Model with mathematics. MP.6. Attend to precision. **NCTM: Mathematics** <u>**NCTM: Grades 3 - 5**</u> **Number & Operations** **Understand numbers, ways of representing numbers, relationships among numbers, and number systems** understand the place-value structure of the base-ten number system and be able to represent and compare whole numbers and decimals; recognize equivalent representations for the same number and generate them by decomposing and composing numbers; recognize and generate equivalent forms of commonly used fractions, decimals, and percents; **Understand meanings of operations and how they relate to one another** understand various meanings of multiplication and division; identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems; understand and use properties of operations, such as the distributivity of multiplication over addition. **Compute fluently and make reasonable estimates**	• **Division of decimals by whole numbers** • **Division of decimals by decimals** • **Zeros in the quotient** • **Multiply and Divide money**	• **Divide decimals by whole numbers** • **Divide decimals by decimals.** • **Calculate with zeros in division.** • **Multiply and divide money.**

Unit	Standards	Content	Skills
	develop fluency with basic number combinations for multiplication and division and use these combinations to mentally compute related problems, such as 3050		
	develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience;		
	use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals;		
	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		
	Algebra **Represent and analyze mathematical situations and structures using algebraic symbols**		
	express mathematical relationships using equations.		
	Process Standards **Problem Solving**		
	Build new mathematical knowledge through problem solving		
	Solve problems that arise in mathematics and in other contexts		
	Apply and adapt a variety of appropriate strategies to solve problems		
	Monitor and reflect on the process of mathematical problem solving		
	Reasoning and Proof		
	Recognize reasoning and proof as fundamental aspects of mathematics		
	Make and investigate mathematical conjectures		

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

Unit	Standards	Content	Skills
Fractions	**CCSS: Mathematics** **CCSS: Grade 5** **Number & Operations—Fractions** **5.NF.A. Use equivalent fractions as a strategy to add and subtract fractions.** 5.NF.A.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. 5.NF.A.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. **5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.** 5.NF.B.3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. 5.NF.B.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 5.NF.B.5a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.	**Fraction Concepts** • Reading and writing fractions (modeling, understanding, and representing fractions) • Factors, multiples, primes, and composites • Apply divisibility rules to simplify • Greatest common factor (GCF) • Least common multiple (LCM & LCD) • Simplest form • Equivalent fractions • Mixed numbers • Improper fractions (Fractions greater than one) • Comparison and order fractions • Comparing and ordering fractions on a number line • Conversion of improper fractions and mixed numbers • Identify a unit or benchmark fraction **Addition and Subtraction of Fractions** • Estimation of sums and differences of fractions and mixed numbers (rounding) • Addition of fractions and mixed numbers with like and **unlike** denominators • Subtraction of fractions and mixed numbers with like and **unlike** denominators	The students will be able to: • Determine GCF in order to calculate equivalent fractions. • Write fractions in simplest form. • Compare and order fractions and mixed numbers. • Compare and order fractions and mixed numbers on a number line. • Identify a unit or benchmark fraction. • Convert improper fractions and mixed numbers. • Estimate sums and differences of fractions and mixed numbers. • Add fractions and mixed numbers with like and **unlike** denominators. • Subtract fractions and mixed numbers with like and **unlike** denominators. • **Estimate products and quotients with fraction and mixed numbers.** • **Multiply fractions by fractions, whole numbers, and mixed numbers.** • **Simplify fraction prior to multiplication (Canceling).** • **Identify reciprocals in order to divide.** • **Divide whole numbers by fractions.**

Unit	Standards	Content	Skills
	5.NF.B.5b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. 5.NF.B.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem. 5.NF.B.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 5.NF.B.7a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. 5.NF.B.7b. Interpret division of a whole number by a unit fraction, and compute such quotients. 5.NF.B.7c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. **NCTM: Mathematics** **NCTM: Grades 3 - 5** **Number & Operations** **Understand numbers, ways of representing numbers, relationships among numbers, and number systems**	• Subtraction with renaming **Multiplication and Division of Fractions** • **Estimation of products and quotients with fraction and mixed numbers (rounding and compatible numbers)** • **Multiplication of fractions by fractions and whole numbers** • **Simplification of fraction prior to multiplication (Canceling)** • **Multiplication of fractions and mixed numbers** • **Multiplication of mixed numbers by mixed numbers** • **Reciprocals** • **Division of whole numbers by fractions** • **Division of fractions by fractions** • **Division of fractions by whole numbers** • **Division of mixed numbers by fractions** • **Division of mixed numbers by mixed numbers**	• **Divide fractions by fractions and whole numbers.** • **Divide mixed numbers by fractions and mixed numbers.** • **Apply divisibility rules to simplify fractions.**

Unit	Standards	Content	Skills
	recognize equivalent representations for the same number and generate them by decomposing and composing numbers;		
	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;		
	use models, benchmarks, and equivalent forms to judge the size of fractions;		
	recognize and generate equivalent forms of commonly used fractions, decimals, and percents;		
	explore numbers less than 0 by extending the number line and through familiar applications;		
	describe classes of numbers according to characteristics such as the nature of their factors.		
	Understand meanings of operations and how they relate to one another		
	understand various meanings of multiplication and division;		
	identify and use relationships between operations, such as division as the inverse of multiplication, to solve problems;		
	Compute fluently and make reasonable estimates		
	develop and use strategies to estimate computations involving fractions and decimals in situations relevant to students' experience;		
	use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals;		
	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		
	Algebra		

Unit	Standards	Content	Skills
	Understand patterns, relations, and functions		
	describe, extend, and make generalizations about geometric and numeric patterns;		
	represent and analyze patterns and functions, using words, tables, and graphs.		
	Use mathematical models to represent and understand quantitative relationships		
	model problem situations with objects and use representations such as graphs, tables, and equations to draw conclusions.		
	Connections		
	Recognize and use connections among mathematical ideas		
	Understand how mathematical ideas interconnect and build on one another to produce a coherent whole		
	Recognize and apply mathematics in contexts outside of mathematics		
	Representation		
	Create and use representations to organize, record, and communicate mathematical ideas		
	Select, apply, and translate among mathematical representations to solve problems		
	Use representations to model and interpret physical, social, and mathematical phenomena		
Geometry	**CCSS: Mathematics** **CCSS: Grade 5** **Number & Operations—Fractions**	• Triangles • Polygons • Classification of angles • Measurement of angles	The students will be able to: • Measure degree of angles.

Unit	Standards	Content	Skills
	5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions. 5.NF.B.4b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas. **Measurement & Data** **5.MD.C. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.** 5.MD.C.3a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. 5.MD.C.3b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. 5.MD.C.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. 5.MD.C.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. 5.MD.C.5a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. 5.MD.C.5b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge	• Estimation of angles and other geometric figures • Quadrilaterals • Classification of two dimensional figures into different categories • Perimeter, Area, Volume • Coordinate planes • Protractor and Compass • Circles, Radius, Diameter, and Chords • Types of lines • Geometric properties, patterns, and relationship • Comparing geometric figures	• Classify angles and two dimensional figures. • Compare and classify measurement of angles. • Measure and draw angles with a protractor. • Name and describe polygons, quadrilaterals, and triangles. • Solve for degrees of missing angles. • Distinguish between and use formulas to calculate perimeter and area in problem solving. • Find the volume of a rectangular prism. • Label the radius, diameter, and chords of a circle. • Calculate circumference and area of a circle. • Estimate measurements of measure and angles. • **Plot points on a coordinate plane.**

Unit	Standards	Content	Skills
	lengths in the context of solving real world and mathematical problems. 5.MD.C.5c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. **Geometry** **5.G.A. Graph points on the coordinate plane to solve real-world and mathematical problems.** 5.G.A.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate). 5.G.A.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. **5.G.B. Classify two-dimensional figures into categories based on their properties.** 5.G.B.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles. 5.G.B.4. Classify two-dimensional figures in a hierarchy based on properties. **Mathematical Practice**		

Unit	Standards	Content	Skills
	MP.The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. MP.5. Use appropriate tools strategically. **NCTM: Mathematics** **NCTM: Grades 3 - 5** **Geometry** **Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships** identify, compare, and analyze attributes of two- and three-dimensional shapes and develop vocabulary to describe the attributes; classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids; **Specify locations and describe spatial relationships using coordinate geometry and other representational systems** describe location and movement using common language and geometric vocabulary; make and use coordinate systems to specify locations and to describe paths; **Apply transformations and use symmetry to analyze mathematical situations** identify and describe line and rotational symmetry in two- and three-dimensional shapes and designs. **Use visualization, spatial reasoning, and geometric modeling to solve problems** build and draw geometric objects;		

Unit	Standards	Content	Skills
	use geometric models to solve problems in other areas of mathematics, such as number and measurement; recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life. **Measurement** **Understand measurable attributes of objects and the units, systems, and processes of measurement** explore what happens to measurements of a two-dimensional shape such as its perimeter and area when the shape is changed in some way. **Apply appropriate techniques, tools, and formulas to determine measurements** develop strategies for estimating the perimeters, areas, and volumes of irregular shapes; develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms; develop strategies to determine the surface areas and volumes of rectangular solids. 		

Measurement and Conversions	**CCSS: Mathematics**
	 CCSS: Grade 5
	 Number & Operations—Fractions
	 5.NF.B. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
	
	 5.NF.B.5. Interpret multiplication as scaling (resizing), by:
	
	 Measurement & Data
		• Conversions
		 • Metric Units
		    o Length: cm, m, km, dm
		    o Capacity: mL, L
		    o Weight: mg, g, kg
		 • Customary Units
		    o Length: in, ft, yd, mi
		    o Capacity: fl oz, c, qt, pt, gal
			The students will be able to:
			
			 • Understand relative size of measurement units (km, m, g , l, ml, yd, ft, in, lb, oz, gal, qt, pt, c)
			 • Use appropriate measuring tools for various applications.
			 • Estimate measurement.

Unit	Standards	Content	Skills
	5.MD.A. Convert like measurement units within a given measurement system. 5.MD.A.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. **NCTM: Mathematics** **NCTM: Grades 3 - 5** **Geometry** **Specify locations and describe spatial relationships using coordinate geometry and other representational systems** find the distance between points along horizontal and vertical lines of a coordinate system. **Measurement** **Understand measurable attributes of objects and the units, systems, and processes of measurement** understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute; understand the need for measuring with standard units and become familiar with standard units in the customary and metric systems carry out simple unit conversions, such as from centimeters to meters, within a system of measurement; understand that measurements are approximations and how differences in units affect precision; **Apply appropriate techniques, tools, and formulas to determine measurements** select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles;	o Weight: oz, lb • Compute with customary units • Convert between customary units • Convert between metric units • Identify appropriate measuring tools for various applications	• Measure customary and metric units of length, weight, and capacity to units within the same measurement system. • Solve word problems involving distances, volume and weight. • Convert between customary units. • Convert between metric units.

Unit	Standards	Content	Skills
	select and use benchmarks to estimate measurements; 		
Data Analysis and Probability	**CCSS: Mathematics** **CCSS: Grade 5** **Operations & Algebraic Thinking** **5.OA.A. Write and interpret numerical expressions.** 5.OA.A.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. **Measurement & Data** **5.MD.B. Represent and interpret data.** 5.MD.B.2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. **NCTM: Mathematics** **NCTM: Grades 3 - 5** **Algebra** **Analyze change in various contexts** identify and describe situations with constant or varying rates of change and compare them. **Data Analysis & Probability** **Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them**	- Probability - Collection and organization of data - Mean, median, mode, and range - Graphing sense - Outlier - Line plots - Histograms - Line graphs - Circle graphs	The students will be able to: - Collect, organize and interpret data. - Find the mean, median, mode, and range of a set of data. - Using the appropriate graph for the data. - Create and interpret line plots, histograms, line graphs, and circle graphs correctly. - Predict, test, and record the probability of an outcome of an event. - Use sampling methods.

Unit	Standards	Content	Skills
	design investigations to address a question and consider how data-collection methods affect the nature of the data set;		
	collect data using observations, surveys, and experiments;		
	represent data using tables and graphs such as line plots, bar graphs, and line graphs;		
	recognize the differences in representing categorical and numerical data.		
	Select and use appropriate statistical methods to analyze data		
	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;		
	use measures of center, focusing on the median, and understand what each does and does not indicate about the data set;		
	compare different representations of the same data and evaluate how well each representation shows important aspects of the data.		
	Understand and apply basic concepts of probability		
	describe events as likely or unlikely and discuss the degree of likelihood using such words as certain, equally likely, and impossible;		
	predict the probability of outcomes of simple experiments and test the predictions;		
	understand that the measure of the likelihood of an event can be represented by a number from 0 to 1.		

Unit	Standards	Content	Skills
Problem Solving	**CCSS: Mathematics** **CCSS: Grade 5** **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.** MP.1. Make sense of problems and persevere in solving them. **NCTM: Mathematics** **NCTM: Grades 3 - 5** **Process Standards** **Problem Solving** Build new mathematical knowledge through problem solving Solve problems that arise in mathematics and in other contexts Apply and adapt a variety of appropriate strategies to solve problems Monitor and reflect on the process of mathematical problem solving **Reasoning and Proof** Develop and evaluate mathematical arguments and proofs Select and use various types of reasoning and methods of proof **Communication** Organize and consolidate their mathematical thinking through communication Communicate their mathematical thinking coherently and clearly to peers, teachers, and others	• Guess and Test • Use more than one step • Make a Table/Find a Pattern • Make an Organized List • Work backward • Use simpler numbers • Use a model/diagram • Use more than one step • Write a number sentence • Draw a picture • Combine strategies to solve • Write an equation • Estimation	The students will be able to: • Develop strategies to solve word problems related to various math topics. • Solve word problems. • Interpret data. • Write original word problems. • Develop algebraic equations. • Communicate problem solving reasoning. • Apply a variety of problem solving strategies. • Represent data visually. • Estimate. • Use problem solving strategies.

Unit	Standards	Content	Skills
	Analyze and evaluate the mathematical thinking and strategies of others;		
	Use the language of mathematics to express mathematical ideas precisely.		
	Connections		
	Recognize and use connections among mathematical ideas		
	Recognize and apply mathematics in contexts outside of mathematics		
	Representation		
	Create and use representations to organize, record, and communicate mathematical ideas		
	Select, apply, and translate among mathematical representations to solve problems		
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