Mathematics

Mathematics is an area of academics designed to prepare individuals for our global society that is increasing in moral and technological complexity. To meet these demands, the students in Diocese of Green Bay Catholic schools will develop problem solving skills in light of Catholic faith and doctrine, with an understanding that Mathematics reflects order and unity in God's universe and describes real life consistencies which God created and sustains.

These standards define what a student at particular grade levels should understand and be able to do by the end of that grade level. Standards do not dictate the curriculum, resources and teaching methods used to teach the concepts.

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Mathematics

NUMBER SENSE and NUMERATION including FRACTIONS

Develop an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

Third Grade	Fourth Grade	Fifth Grade
1. **Understand the place-value structure of the base-ten number system and be able to represent and compare, order and round whole numbers and decimals.**	1. **Understand the place-value structure of the base-ten number system and be able to represent and compare, order and round whole numbers and decimals.**	1. **Understand the place-value structure of the base-ten number system and be able to represent and compare, order and round whole numbers and decimals.**
a. Identify, read, write whole numbers in standard and expanded form through the hundred-thousands.	a. Recognize, read, write, order, compare whole numbers to 1, 000,000	a. Order and compare whole numbers and decimals up to the 10 billions and thousandths.
b. Round numbers to the nearest hundred, thousand, ten-thousand place	b. Reads and writes whole number in standard and expanded form through a million.	b. Round whole numbers to ten billions and decimals to the thousandths.
c. Identify the place value and value of each digit from hundred-thousands to the tenth place.	c. Estimate and round numbers to 1 million.	c. Convert between numbers in standard, word and expanded form for numbers up to billions and decimals to thousandths.
d. **Order and compare whole numbers using symbols for "less than, <" "equal to, = " and "greater than, >" to the hundred-thousands**	d. Identify and write whole numbers up to 1, 000,000, given a place-value model	d. Introduce expanded form with exponents.
e. Identify Roman Numerals to 1000 (using I, V, X, L, C, D, M)	e. Read and write decimals to hundredths	
	f. Understand decimals as parts of a whole number.	
	g. **Order and compare whole numbers using symbols for "less than, <" "equal to, = " and "greater than, >"**	
	h. **Define prime and composite numbers**	
	i. Identify prime numbers	

2. **Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers** a. Use words, models, and expanded form to represent numbers up to 100,000	2. **Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers.**	2. **Develop a sense of whole numbers and represent and use them in flexible ways, including relating, composing, and decomposing numbers.**

3. **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.**
 	
   a. Identify and use correct names for numerator and denominator
	3. **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.**
	
	   a. Rename and rewrite whole numbers as fractions
	
	   b. Use objects or pictures, name and write mixed numbers.
	
	   c. Use factorization to express whole numbers as products of prime factors
		3. **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.**
		
		   a. Explain different interpretations of fractions: as parts of a whole, parts of a set, and division of whole numbers by whole numbers.
		
		   b. Identify, on a number line, the relative position of simple positive fractions, positive mixed numbers and positive decimals.

4. **Use models, benchmarks, and equivalent forms to judge the size of fractions**
 	
   a. Recognize that equivalent fractions are the same size
 	
   b. Write fractions to represent locations on a number line.
 	
   c. Recognize that *equivalent fractions* are the same size.
 	
   d. Recognize and generate simple *equivalent fractions*.
 	
   e. Compare a given pair of fractions using objects or pictures and symbols: <, >, =
 	
   f. Compare two fractions with the
	4. **Use models, benchmarks, and equivalent forms to judge the size of fractions**
	
	   a. Write mixed numbers as improper fractions, based on objects or pictures.
	
	   b. Write equivalent fractions in simplest form.
		4. **Use models, benchmarks, and equivalent forms to judge the size of fractions**
		
		   a. Write mixed numbers as improper fractions, and proper as improper based on objects or pictures.
		
		   b. Write equivalent fractions in simplest form.

same *numerator* or *denominator*. g. Recognize that comparisons are valid only when the two fractions refer to the same whole number.		
5. **Recognize and generate equivalent forms of commonly used fractions, decimals, and percent** a. Given a set of objects or a picture, name and write a decimal to represent tenths and hundredths b. Given a decimal for tenths, show it as a fraction using a place-value model. c. Round $ amounts to the nearest dollar and ten dollars.	5. **Recognize and generate equivalent forms of commonly used fractions, decimals, and percent** a. Represent tenths and hundredths in decimal and fraction notations (half and fourth) b. Round decimals to tenths, hundredths, and nearest whole number.	5. **Recognize and generate equivalent forms of commonly used fractions, decimals, and percent** a. Represent tenths and hundredths in decimal, percent, and fraction notation (half, fourth, third)
	6. **Describe classes of numbers according to characteristics such as the nature of their factors.** a. **Describe and identify prime and composite numbers**	6. **Describe classes of numbers according to characteristics such as the nature of their factors.** a. **Describe and identify prime and composite numbers for numbers up to 20** b. **Describe and identify prime factorization, GCF and LCM of numbers**
		7. **Explore numbers less than 0 by extending the number line and through familiar applications.** a. Identify negative numbers on a number line b. Identify negative number in real life authentic situations.

OPERATIONS and ALGEBRAIC THINKING

Use basic and advanced procedures while performing the processes of computation and apply basic and advanced properties of functions and algebra.

Third Grade	Fourth Grade	Fifth Grade

1. **Understand meanings of operations and how they relate to one another. (Computation)**
 	
   a. Represent the concept of multiplication as repeated addition.
 	
   b. Interpret multiplication as the total of equal groups.
 	
   c. Interpret division as sharing equally or making equal shares
 	
   d. Use multiplication and division within 100 to solve word problems.
 	
   e. Multiply and divide whole numbers using correct vocabulary: *product and quotient*
	1. **Understand meanings of operations and how they relate to one another. (Computation)**
	
	   a. Use a standard algorithm to multiply numbers using relevant properties of the number system
	
	   b. Use a standard algorithm to divide numbers without remainders, using relevant properties of the number system.
		1. **Understand meanings of operations and how they relate to one another (Computation)**
		
		   a. Use a standard algorithm to multiply numbers using relevant properties of the number system
		
		   b. Use a standard algorithm to divide numbers without remainders, using relevant properties of the number system

2. **Understand the general principles and properties of multiplication and division.**
 	
   a. Identify the inverse relationship between multiplication and division facts
 	
   b. Apply the commutative and associative properties for multiplication and the distributive property when learning basic facts.
 	
   c. Identify the *0 property* of multiplication and *the identity property* of multiplication (multiply by 1)
	2. **Understand the general principles and properties of multiplication and division.**
	
	   a. Identify fact families as inverse operations in problem solving
	
	   b. Using models, demonstrate the *distributive property* to multiply two-digit numbers.
	
	   c. Use the distributive property in numerical equations and expressions.
		2. **Understand the general principles and properties of multiplication and division.**
		
		   a. Use the distributive property in numerical equations and expressions.

3. **Understand the meaning of operations and develop fluency in adding, subtracting, multiplying, and dividing whole numbers.**
 	
  a. Compute fluently with basic number combinations and recall addition and subtraction facts.
 	
  b. Regroup using addition
 	
  c. Add 3 or more two-digit addends
 	
  d. Subtract across zeros.
 	
  e. Fluently recall multiplication and division facts (0-10).
 	
  f. Use estimation to decide whether answers are reasonable in addition and subtraction computations.
	3. **Understand the meaning of operations and develop fluency in adding, subtracting, multiplying, and dividing whole numbers**
	
	  a. Compute fluently with basic number combinations and fluently recall multiplication and division facts 0-12.
	
	  b. Compute with basic multiplication facts using 11's and 12's
	
	  c. Identify, select and use the most appropriate method of computation for all operations.
	
	  d. Compute multiplication of up to 3-digit numbers by 3-digit numbers
	
	  e. Uses rules of divisibility to compute and make reasonable estimates
	
	  f. Apply strategies for estimating results of any whole – number computations in addition, subtraction, multiplication, and division
		3. **Understand the meaning of operations and develop fluency in adding, subtracting, multiplying, and dividing whole numbers**
		
		  a. Fluently recall multiplication and division facts 0-12
		
		  b. Compute with basic multiplication facts using 11's and 12's
		
		  c. Identify, select and use the most appropriate method of computation for all operations.
		
		  d. Identify patterns in multiples of 10. Divide by multiples of 10, 100, 1000.
		
		  e. Use rules of divisibility (2,3,5,6,9 and 10) to compute fluently and make reasonable estimates.
		
		  f. Divide whole numbers with up to 4 –digit quotients with a remainder
		
		  g. Divide whole numbers with a 2-digit divisor
		
		  h. Solve problems involving multiplication and division of any whole numbers.

4. **Develop and use strategies to estimate computations involving whole numbers, fractions and decimals in situations relevant to the learners' experiences**
 	
   a. Use rounding, front-end estimation, or regrouping to estimate addition and subtraction computation with money amounts.
	4. **Develop and use strategies to estimate computations involving whole numbers, fractions and decimals in situations relevant to the learners' experiences**
	
	   a. Apply strategies for estimating results of any fraction and decimal computations.
		4. **Develop and use strategies to estimate computations involving whole numbers, fractions and decimals in situations relevant to the learners' experiences**
		
		   a. Add and subtract decimals and verify the reasonableness of the results.
		
		   b. Use mental arithmetic to add or subtract simple decimals.
		
		   c. Understand methods to multiply fractions.
		
		   d. Understand methods to divide fractions.

5. **Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals.**
 	
   a. Add and subtract simple fractions with the same denominators
 	
   b. Add and subtract money amounts.
	5. **Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals.**
	
	   a. Add and subtract simple fractions with different denominators, using objects and pictures.
	
	   b. Add and subtract fractions, including mixed numbers, with same denominators.
		5. **Use visual models, benchmarks, and equivalent forms to add and subtract commonly used fractions and decimals.**
		
		   a. Use models to demonstrate understanding of multiplication of fractions.
		
		   b. Divide fractions.
		
		   c. Add and subtract fractions, including mixed numbers, with different denominators.

6. **Understand patterns, relations, and functions**
 	
   a. Describe, generate and make generalizations about geometric and numeric patterns.
 	
   b. Solve basic number patterns using addition, subtraction, or multiplication and tell the rule for the pattern.
 	
   c. Represent and analyze patterns and functions using a table
	6. **Understand patterns, relations, and functions**
	
	   a. Solve basic number patterns using multiplication and division and tell the rule for the pattern.
	
	   b. Use a multiplication table to find patterns in multiplication and division.
	
	   c. Use function tables for addition, subtraction and multiplication to represent and analyze patterns and functions.
		6. **Understand patterns, relations, and functions**
		
		   a. Use function tables for addition, subtraction and multiplication to represent and analyze patterns and functions.

7. **Represent and analyze mathematical situations and structures using algebraic symbols. (see OA.2.a,b,c)**
 	
  a. Identify and use the commutative, associative, and zero properties of addition.
 	
  b. Identify and use the commutative, associative, identity, zero, and distributive properties of multiplication.
 	
  c. Use a variable to represent an unknown number in simple equations.
	7. **Represent and analyze mathematical situations and structures using algebraic symbols. (see OA.2.a,b,c)**
	
	  a. Identify and use the commutative, associative, identity, zero, and distributive properties of multiplication.
	
	  b. Use a variable to represent an unknown number in simple equations.
		7. **Represent and analyze mathematical situations and structures using algebraic symbols. (see OA.2.a)**
		
		  a. Use the commutative, associative, identity, zero, and distributive properties in numerical equations and expressions.
		
		  b. Use a variable to represent an unknown number in simple expressions, equations, and *inequalities.* (new term)

8. **Express mathematical relationships using equations.**
 	
  a. Choose appropriate symbols for operations and relations to make a number sentence true.
 	
  b. Write fact families (inverse operations) using multiplication and division. (OA.2.a)
	8. **Express mathematical relationships using equations.**
	
	  a. Use and interpret formulas to answer questions about quantities and their relationships.
	
	  b. Solve simple algebraic expressions with one variable.
		8. **Express mathematical relationships using equations.**
		
		  a. Write simple algebraic expressions with one variable and evaluate them by substitution.

9. **Use mathematical models to represent and understand quantitative relationships.**
 	
  a. Use a variety of models such as graphs, tables, and equations to represent and draw conclusions about a quantitative relationship.
	9. **Use mathematical models to represent and understand quantitative relationships.**
	
	  a. Use a variety of models such as graphs, tables, and equations to represent and draw conclusions about a quantitative relationship.
	
	  b. Identify and graph ordered pairs of positive numbers
		9. **Use mathematical models to represent and understand quantitative relationships.**
		
		  a. Use a variety of models such as graphs, tables, and equations to represent and draw conclusions about a quantitative relationship.
		
		  b. Identify and graph ordered pairs including positive and negative numbers.

10. **Analyze change in various contexts.**	10. **Analyze change in various contexts.**
	
	  a. Use a one-step function table to solve an equation.
		10. **Analyze change in various contexts.**
		
		  a. Use function tables to evaluate expressions.

| | | b. Use function tables and expressions to describe and extend patterns |
| | | c. Use information from a graph or equation to answer questions about a problem or situation. |

MEASUREMENT and DATA

Understand measurable attributes of objects and the units, systems, and processes of measurement

Third Grade	Fourth Grade	Fifth Grade

1. **Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.**
   a. Identify the measurable attributes of an object (*length, area, weight, volume, size*) of an angle
   b. Name units to measure *length, area, weight, volume* (capacity) and angles.
	1. **Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.**
	   a. Identify the measurable attributes of an object (*length, area, weight, volume, size*) of an angle
	   b. Name units to measure *length, area, weight, volume* (capacity) and angles.
		1. **Understand such attributes as length, area, weight, volume, and size of angle and select the appropriate type of unit for measuring each attribute.**
		   a. Identify the measurable attributes of an object (*length, area, weight, volume, size*) of an angle
		   b. Name units to measure *length, area, weight, volume* (capacity) and angles.

2. **Estimate and measure in both customary and metric measurements of length, weight, capacity, temperature, time and money.**
 	
   a. Identify units of measure in **length** (*inch, ½ inch, ¼ inch, foot, yard, mile, millimeter, centimeter, meter, decimeter, and kilometer*)
 	
   b. Identify units of measure in **weight** (*ounce, pound, ton, gram, kilogram*)
 	
   c. Identify units of **volume** (*fluid ounce, cup, quart, pint, gallon, milliliter, liter*)
 	
   d. Identify the unit of measure in **angles** – (*degree*)
 	
   e. **Money** - Count coins and bills to make change from a given amount.
	2. **Estimate and measure in both customary and metric measurements of length, weight, capacity, temperature, time and money.**
	
	   a. Identify units of measure in **length** (*inch, ½ inch, ¼ inch, foot, yard, mile, millimeter, centimeter, meter, decimeter, and kilometer*)
	
	   b. Identify units of measure in **weight** (*ounce, pound, ton, gram, kilogram*)
	
	   c. Identify units of **volume** (*fluid ounce, cup, quart, pint, gallon, milliliter, liter*)
	
	   d. Identify the unit of measure in **angles** – (*degree*)
	
	   e. **Money** - Count coins and bills to make change from a given amount.
		2. **Estimate and measure in both customary and metric measurements of length, weight, capacity, temperature, time and money.**
		
		   a. Identify units of measure in **length** (*inch, ½ inch, ¼ inch, foot, yard, mile, millimeter, centimeter, meter, decimeter, and kilometer*)
		
		   b. Identify units of measure in **weight** (*ounce, pound, ton, gram, kilogram*)
		
		   c. Identify units of **volume** (*fluid ounce, cup, quart, pint, gallon, milliliter, liter*)
		
		   d. Identify the unit of measure in **angles** – (*degree*)
		
		   e. **Money** - Count coins and bills to make change from a given amount.

3. **Select and apply appropriate standard units, techniques, tools, and formulas to determine measurements**

   a. **Time –**
      - use analog and digital clocks to tell time to the nearest minute
      - determine elapsed time to the quarter hour.

   b. **Temperature –**
      - Use thermometers to measure temperature using *Celsius* and *Fahrenheit*

   c. **Length –**
      - Use an appropriate ruler to measure length to the nearest inch, half-inch, centimeter, decimeter, meter

   d. **Weight –**
      - Use an appropriate scale to measure weight in ounces, pounds, grams and kilograms.

   e. **Area –**
      - Measure area to the nearest square unit.

3. **Select and apply appropriate standard units, techniques, tools, and formulas to determine measurements**

   a. **Time –**
      - Calculate elapsed time to the nearest minute.

   b. **Temperature –**
      - Use thermometers to measure temperature using *Celsius* and *Fahrenheit* in positive and negative degrees

   c. **Length –**
      - Select and use an appropriate instrument to measure length to the nearest quarter-inch, eighth-inch, millimeter, centimeter for a given situation

   d. **Weight –**
      - Select and use an appropriate scale to measure weight in ounces, pounds, grams and kilograms for a given situation

   e. **Volume (Capacity)**
      - Select and use appropriate units of volume, pint, quart, gallon, liter for a given situation
      - Determine the volume of a rectangular solid in cubic units

   f. **Area –**
      - Measure area to the nearest

3. **Select and apply appropriate standard units, techniques, tools, and formulas to determine measurements**

   a. **Time –**
      - Calculate elapsed time to the nearest second.

   b. **Temperature –**
      - Use thermometers to measure temperature using *Celsius* and *Fahrenheit* in positive and negative degrees

   c. **Length –**
      - Select and use an appropriate instrument to measure length to the nearest quarter-inch, eighth-inch, millimeter, centimeter for a given situation

   d. **Weight –**
      - Select and use an appropriate scale to measure weight in ounces, pounds, grams and kilograms for a given situation

   e. **Volume (Capacity)**
      - Select and use appropriate units of volume, pint, quart, gallon, liter for a given situation
      - Determine the volume of a rectangular solid in cubic units

   f. **Area –**
      - Measure area to the nearest

	square unit.
	
	g. **Angles**
	
	   • Use a protractor to measure angles.
		square unit.
		
		g. **Angles**
		
		   • Use a protractor to measure angles.

4. **Apply simple unit conversions in customary measure and metric measure.**
 	
a. Convert basic units of **length**
 	
   • Inch, foot, yard
 	
   • Centimeter and meter
 	
b. Convert basic units of **volume (capacity)**
 	
   • Fluid ounce, cup, pint, quart, gallon
 	
c. Convert basic units of **weight**
 	
   • Ounce, pound, ton
 	
d. Convert basic units of **time**
 	
   • Hour, minute, day, week, month and year.
	4. **Apply simple unit conversions in customary measure and metric measure.**
	
	a. Convert basic units of **length**
	
	   • Inch, foot, yard, mile
	
	   • Millimeter, centimeter, decimeter, meter, kilometer
	
	b. Convert basic units of **volume (capacity)**
	
	   • Fluid ounce, cup, pint, quart, gallon
	
	   • Milliliter, liter
	
	c. Convert basic units of **weight/mass**
	
	   • Ounce, pound, ton
	
	   • Gram, kilogram
	
	d. Convert basic units of **time**
	
	   • Hour, minute, second, day, week, month, year, decade, century
		4. **Apply simple unit conversions in customary measure and metric measure.**
		
		a. Convert basic units of **length**
		
		   • Inch, foot, yard, mile
		
		   • Millimeter, centimeter, decimeter, meter, kilometer
		
		b. Convert basic units of **volume (capacity)**
		
		   • Fluid ounce, cup, pint, quart, gallon
		
		   • Milliliter, liter
		
		c. Convert basic units of **weight/mass**
		
		   • Ounce, pound, ton
		
		   • Gram, kilogram
		
		d. Convert basic units of **time**
		
		   • Hour, minute, second, day, week, month, year, decade, century

5. **Develop strategies for estimating the perimeter, area, and volume of irregular shapes.**
 	
    a. Estimate area and volume of irregular shapes using square or cubic units.
	5. **Develop strategies for estimating the perimeter, area, and volume of irregular shapes.**
	
	    a. Estimate area and volume of irregular shapes using square or cubic units
		5. **Develop strategies for estimating the perimeter, area, and volume of irregular shapes.**
		
		    a. Determine how the area and perimeter of a parallelogram change when the shape is changed
		
		    b. Estimate area and volume of irregular shapes using square or cubic units

6. **Select and use benchmarks to estimate measurements.**
 	
    a. Temperature: estimate degrees in Celsius and Fahrenheit and use descriptors of hot, cold, warm, cool, etc. for a given situation.
 	
    b. Length: estimate length to the nearest inch, half-inch, centimeter, decimeter, and meter
 	
    c. Capacity: estimate capacity using pint, quarts, gallons, and liters
 	
    d. Volume: estimate volume using cubic units.
 	
    e. Weight: estimate weight using ounces, pounds, grams, and kilograms
 	
    f. Area: estimate length to the nearest square unit.
	6. **Select and use benchmarks to estimate measurements.**
	
	    a. Length: estimate length to the nearest quarter-inch, eighth-inch, centimeter, millimeter, and meter
	
	    b. Capacity: estimate capacity using cup, pint, quart, gallon, and liter and millimeter
	
	    c. Volume: estimate volume using cubic units.
	
	    d. Weight/Mass: estimate weight using ounce, pound, ton, gram, and kilogram
	
	    e. Area: estimate length to the nearest square unit.
		6. **Select and use benchmarks to estimate measurements.**
		
		    a. Length: estimate length to the nearest quarter-inch, eighth-inch, centimeter, millimeter, and meter
		
		    b. Capacity: estimate capacity using cup, pint, quart, gallon, and liter and millimeter
		
		    c. Volume: estimate volume using cubic units.
		
		    d. Weight/Mass: estimate weight using ounce, pound, ton, gram, milligram and kilogram
		
		    e. Area: estimate length to the nearest square unit.

7. **Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.**
 	
    a. Find perimeter and area of basic shapes (rectangle, square, triangle)
	7. **Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.**
	
	    a. Identify and apply the formula for finding the perimeter of rectangles and square and right triangles.
		7. **Develop, understand, and use formulas to find the area of rectangles and related triangles and parallelograms.**
		
		    a. State and use formulas for finding the perimeter of rectangles, squares, and triangles
		
		    b. State and use formulas for finding

	b. Identify and apply the formula for finding the area of rectangles and square and right triangles.	the area of rectangles, squares, and triangles

8.   **Develop strategies to determine the surface areas and volumes of rectangular solids.**
 	
   a.   Find the volume of a solid figure using cubic units.
	8. **Develop strategies to determine the surface areas and volumes of rectangular solids.**
	
	   a. Determine the volume of a rectangular solid.
	
	   b. Determine the surface area of a rectangular solid.
		8. **Develop strategies to determine the surface areas and volumes of rectangular solids.**
		
		   a. Determine the volume of a rectangular solid.
		
		   b. Determine the surface area of a rectangular solid.

GEOMETRY

Analyze characteristics and properties of two and three dimensional geometric shapes and develop mathematical arguments about geometric relationships.

Third Grade	Fourth Grade	Fifth Grade

1. **Identify, compare, and analyze attributes of two and three-dimensional shapes and develop vocabulary to describe the attributes**
 	
   a. Identify different two-dimensional (plane) figures: regular and irregular
 	
   b. Describe two-dimensional and three-dimensional shapes using the terms *point, line, line segment, ray, angle, vertex, face and edge.*
 	
   c. Identify *parallel, perpendicular, and intersecting lines.*
	1. **Identify, compare, and analyze attributes of two and three-dimensional shapes and develop vocabulary to describe the attributes**
	
	   a. Identify different two-dimensional (plane) figures: circles and regular/irregular polygons
	
	   b. Describe two-dimensional and three-dimensional shapes using the terms *point, line, line segment, ray, angle, vertex, face edge, radius, diameter, chord, and center*
	
	   c. Draw and label *points lines, line segments, parallel, perpendicular, intersecting, ray, and angle* using letters and geometric symbols.
	
	   d. Identify *triangular prism, square pyramid, triangular pyramid.*
		1. **Identify, compare, and analyze attributes of two and three-dimensional shapes and develop vocabulary to describe the attributes**
		
		   a. **Identify and compare** *triangular prism, square pyramid, triangular pyramid.*

2. **Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids;**
 	
   a. Identify and classify polygons and define according to their properties.
 	
     • Triangles (equilateral, isosceles, right, scalene)
 	
     • Quadrilateral (rectangle, parallelogram, square)
	2. **Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids;**
	
	   a. Identify and classify polygons and define according to their properties.
	
	     • Triangles (equilateral, isosceles, right, scalene)
	
	     • Quadrilateral (rectangle, parallelogram, square)
		2. **Classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes such as triangles and pyramids;**
		
		   a. Identify and classify polygons and define according to their properties.
		
		     • Triangles (equilateral, isosceles, right, scalene, acute, obtuse)
		
		     • Quadrilateral (rectangle, parallelogram, square,

		trapezoid, rhombus)
• Pentagon	• Pentagon	• Pentagon
• Hexagon	• Hexagon	• Hexagon
• Octagon	• Octagon	• Octagon
		b. Classify three-dimensional shapes according to their attributes.

3. **Investigate, describe, make, test and reason about geometric properties and relationships.**
 	
    a. Identify congruent and similar figures
	3. **Investigate, describe, make, test and reason about geometric properties and relationships.**
	
	    a. Develop logical arguments to justify conclusions relating to symmetry and congruency
		3. **Investigate, describe, make, test and reason about geometric properties and relationships.**
		
		    a. Develop logical arguments to justify conclusions relating to symmetry and congruency

4. **Graph points on the coordinate plane to specify locations and describe special relationships to solve real-world and mathematical problems.**
 	
    a. Locate a point on a grid given an *ordered pair*
 	
    b. Name the *ordered pair* for a point on a grid
 	
    c. Find the distance/change between two points on either the vertical or horizontal line within the first quadrant.
	4. **Graph points on the coordinate plane to specify locations and describe special relationships to solve real-world and mathematical problems.**
	
	    a. Plot the point on a grid given an *ordered pair.*
	
	    b. Plot ordered pairs from a function table and draw a line to solve a problem.
	
	    c. Find the distance/change between two points on either the vertical or horizontal line within the first quadrant.
		4. **Graph points on the coordinate plane to specify locations and describe special relationships to solve real-world and mathematical problems.**
		
		    a. Define and identify the terms *quadrant, origin, x-axis, y-axis*
		
		    b. Plot points on a four-quadrant grid given ordered pairs.
		
		    c. Name the ordered pair for a point on a four-quadrant grid.
		
		    d. Find the distance/change between two points on either the vertical or horizontal line within the first quadrant.

5. **Apply transformations and use symmetry to analyze mathematical situations**
 	
   a. Identify and draw lines of symmetry in geometric shapes
 	
   b. Describe the changes in direction and position that occur in a figure as a result of a transformation: *translation (slide), reflection (flip), or rotation (turn).*
 	
   c. Justify congruency of two shapes using descriptions of transformations.
	5. **Apply transformations and use symmetry to analyze mathematical situations**
	
	   a. Identify rotational and line symmetry in polygons.
	
	   b. Identify shapes that have rotational symmetry
	
	   c. Describe the changes in direction and position that occur in a figure as a result of a transformation: *translation (slide), reflection (flip), or rotation (turn).*
	
	   d. Justify congruency of two shapes using descriptions of transformations.
		5. **Apply transformations and use symmetry to analyze mathematical situations**
		
		   a. Identify rotational and line symmetry in polygons
		
		   b. Identify shapes that have rotational symmetry.
		
		   c. Describe and predict the changes in direction and position that occur in a figure as a result of a transformation: *translation (slide), reflection (flip), or rotation (turn).*
		
		   d. Describe *tessellation.*

6. **Use visualization, spatial reasoning, geometric modeling and relate ideas in geometry to ideas in number and measurement to solve problems**
 	
   a. Build and draw lines, line segments, rays and angles.
 	
   b. Describe an object using geometric shapes to solve problems
 	
   c. Continue a pattern of geometric shapes to solve a problem
	6. **Use visualization, spatial reasoning, geometric modeling and relate ideas in geometry to ideas in number and measurement to solve problems**
	
	   a. Build and draw polygons
	
	      • Triangles (equilateral, isosceles, right, scalene)
	
	      • Quadrilateral (rectangle, parallelogram, square)
	
	      • Pentagon
	
	      • Hexagon
	
	      • Octagon
	
	   b. Describe an object using geometric shapes to solve problems.
	
	   c. Continue a pattern of geometric shapes to solve a problem
		6. **Use visualization, spatial reasoning, geometric modeling and relate ideas in geometry to ideas in number and measurement to solve problems**
		
		   a. Draw circles and polygons
		
		      • Triangles (equilateral, isosceles, right, scalene acute, obtuse)
		
		      • Quadrilateral (rectangle, parallelogram, square, trapezoid, rhombus)
		
		      • Pentagon
		
		      • Hexagon
		
		      • Octagon
		
		   b. Describe an object using geometric shapes to solve problems.
		
		   c. Continue a pattern of geometric shapes to solve a problem

7. **Use geometric models to solve problems in other areas of mathematics**
 	
    a.   Determine *perimeter, area, and volume* using geometric models
	7. **Use geometric models to solve problems in other areas of mathematics**
	
	    a. Determine *perimeter, area, and volume* using geometric models
		7. **Use geometric models to solve problems in other areas of mathematics**
		
		    a. Determine *perimeter, area, and volume* using geometric models

8. **Recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.**
 	
    a.   Examine geometric connections in other disciplines and everyday life.
	8. **Recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.**
	
	    a. Examine geometric connections in other disciplines and everyday life.
		8. **Recognize geometric ideas and relationships and apply them to other disciplines and to problems that arise in the classroom or in everyday life.**
		
		    a. Examine geometric connections in other disciplines and everyday life.

STATISTICS, PROBABILITY, AND DATA ANALYSIS

Design investigations, select, use and appropriate statistical methods to analyze data in order to make inferences and predictions based on data.

Third Grade	Fourth Grade	Fifth Grade

1. **Formulate questions and collect, organize, and display relevant data to answer the question.**
 	
   a. Design an investigation to answer a question
 	
   b. Choose a data collection method
 	
   c. Analyze the effectiveness of the data collection method.
	1. **Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer the question.**
	
	   a. Design an investigation to answer a question
	
	   b. Choose a data collection method
	
	   c. Analyze the effectiveness of the data collection method.
		1. **Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer the question.**
		
		   a. Design an investigation to answer a question
		
		   b. Choose a data collection method
		
		   c. Analyze the effectiveness of the data collection method.

2. **Collect data using observations, surveys, and experiments**
 	
   a. Use Observations, surveys, or experiments to collect data.
	2. **Collect data using observations, surveys, and experiments**
	
	   a. Use Observations, surveys, or experiments to collect data.
		2. **Collect data using observations, surveys, and experiments**
		
		   a. Use Observations, surveys, or experiments to collect data.

3. **Represent data using tables and graphs such as line plots, pictographs, bar graphs, and line graphs.**
 	
   a. Represent data using bar graphs, pictographs, line plot and line graphs.
	3. **Represent data using tables and graphs such as line plots, pictographs, bar graphs, and line graphs.**
	
	   a. Make tables and graphs of information: line plots, bar graphs, line graphs, and pictographs.
	
	   b. Use graphs to display different types of data
	
	   c. Represent data on a number line and in tables, including frequency tables.
		3. **Represent data using tables and graphs such as line plots, pictographs, bar graphs, and line graphs.**
		
		   a. Represent data on graphs such as line, bar, double bar, pictograph, and line plot.
		
		   b. Represent data in tables, including frequency tables.
		
		   c. Use graphs to display different types of data.

4. **Recognize the difference in representing categorical and numerical data** a. Recognize the difference in representing data based on categories (names of objects) and numbers.	4. **Recognize the difference in representing categorical and numerical data** a. Read and make stem and leaf plots	4. **Recognize the difference in representing categorical and numerical data** a. Choose an appropriate graph and identify graphs that are misleading b. Read and make stem and leaf plots
5. **Describe the important features of a set of data and compare related data sets, with an emphasis on how the data are distributed** a. Use models to analyze sets of data b. Describe a data set using the terms *range* and *outlier*	5. **Describe the important features of a set of data and compare related data sets, with an emphasis on how the data are distributed** a. Find the mean of a data set	5. **Describe the important features of a set of data and compare related data sets, with an emphasis on how the data are distributed** a. Find the mean of a data set
6. **Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.** a. Determine the *mode, range, median*, and *mean* in a set of data. b. Describe what *mode, range, median*, and *mean* tell about a data set	6. **Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.** a. Determine the *mode, range, median*, and *mean* in a set of data. b. Describe what *mode, range, median*, and *mean* tell about a data set	6. **Use measures of center, focusing on the median, and understand what each does and does not indicate about the data set.** a. Determine the *mode, range, median*, and *mean* in a set of data. b. Describe what *mode, range, median*, and *mean* tell about a data set
7. **Compare different representations of the same data and evaluate how well each representation shows important aspects of the data.** a. Represent and compare the same data set using a variety of models.	7. **Compare different representations of the same data and evaluate how well each representation shows important aspects of the data** a. Choose an appropriate graph given a set of data. b. Evaluate how well the mean, median and mode represent the data set and choose the appropriate measure	7. **Compare different representations of the same data and evaluate how well each representation shows important aspects of the data** a. Choose an appropriate graph given a set of data. b. Evaluate how well the mean, median and mode represent the data set and choose the appropriate measure

8. **Develop and evaluate inferences and predictions that are based on data.**
 	
   a. Use the results of experiments to predict and justify outcomes.
	8. **Develop and evaluate inferences and predictions that are based on data.**
	
	   a. Use data to predict outcomes of probability experiments.
	
	   b. Express outcomes of experimental probability situations verbally and numerically (e.g. 3 out of 4)
		8. **Develop and evaluate inferences and predictions that are based on data.**
		
		   a. Use data to predict outcomes of probability experiments.
		
		   b. Express outcomes of experimental probability situations verbally and numerically (e.g. 3 out of 4)

9. **Understand and apply basic concepts of probability.**
 	
   a. Describe the probability that an outcome will happen as *likely* or *unlikely* to the degree of *certain, impossible, equally likely*.
 	
   b. Predict and test the possible outcomes for a simple probability experiment
	9. **Understand and apply basic concepts of probability.**
	
	   a. Describe the probability that an outcome will happen using the vocabulary *likely* or *unlikely* to the degree of *certain, impossible, equally likely*.
	
	   b. Interpret data graphs to answer questions about the degree of likelihood of a situation.
	
	   c. Predict and test the possible outcomes for a simple probability experiment
	
	   d. Determine the probability with a value between 0 and 1 (events that are not going to have a probability of 0, events certain to occur have probability 1)
		9. **Understand and apply basic concepts of probability.**
		
		   a. Describe the probability that an outcome will happen using the vocabulary *likely* or *unlikely* to the degree of *certain, impossible, equally likely*.
		
		   b. Interpret data graphs to answer questions about the degree of likelihood of a situation.
		
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		   d. Determine the probability with a value between 0 and 1 (events that are not going to have a probability of 0, events certain to occur have probability 1)