Math Diocesan Learning Standards

The mathematics curriculum of the Diocese of Kansas City-St. Joseph Catholic Schools is designed to reveal the inherent order, symmetry, and logic of the universe. In a faith-based context, mathematics is more than a tool for calculation; it is a language that describes the precision of creation and a discipline that sharpens the mind toward the pursuit of objective truth.

I. Mathematics as a Reflection of Order

We believe that the laws of mathematics are discovered, not merely invented. These laws reflect the consistency and reliability of a well-ordered universe. Our standards emphasize:

- Logical Reasoning: Developing the discipline to follow a sequence of thought to its necessary conclusion.
- Universal Truths: Recognizing that mathematical principles remain constant across cultures and time, providing a foundation for objective understanding.

II. Intellectual Virtue and Perseverance

The study of mathematics is a primary vehicle for developing "habits of mind" that serve the whole person.

- Struggle and Growth: We view the process of solving complex problems as an exercise in perseverance and patience.
- Precision and Integrity: Mathematics demands a commitment to accuracy. Students learn that shortcuts or negligence lead away from the truth, while careful attention to detail leads to clarity.

III. Beauty in Pattern and Proportion

Beyond utility, there is an aesthetic dimension to mathematics. Our curriculum encourages students to appreciate:

- The "Divine" Proportion: Exploring the presence of mathematical patterns (such as the Fibonacci sequence or fractals) in nature and art.
- Symmetry and Elegance: Finding beauty in the simplicity of a balanced equation or the structural logic of a geometric proof.

V. Mathematics in Service to Humanity

Our standards ensure that students do not see mathematics in isolation. We emphasize its application in:

- Stewardship: Using data and finance to manage resources responsibly and ethically.
- Social Justice: Applying statistical analysis to understand and address societal needs.
- Advancement: Utilizing STEM competencies to innovate for the common good and the flourishing of human life.

"Mathematics is the alphabet with which God has written the universe."

FIFTH GRADE

Math Standard Categories:

- Operations and Algebraic Thinking (OA)
- Number and Operations in Base Ten (NBT)
- Number and Operations- Fractions (NF)
- Measurement and Data (MD)
- Geometry (G)

Mathematical Practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

Scripture

- "But you have disposed all things by measure and number and weight." *(Wisdom 11:20)*
- "Teach us to number our days, that we may gain a heart of wisdom." *(Psalm 90:12)*
- "When he weighed out the wind, and measured out the waters;" *(Job 28:25)*
- "This is how you shall build it: the length of the ark will be three hundred cubits, its width fifty cubits, and its height thirty cubits*." (Genesis 6:15)*
- "Then he made the molten sea; It was made with a circular rim, and measured ten cubits across, five in height, and thirty in circumference." *(1 Kings 7:23)*
- "The one who spoke to me held a gold measuring rod to measure the city, its gates, and its wall." *(Revelation 21:15)*
- "You shall have a true scale and true weights, an honest ephah and an honest hin." *(Leviticus 19:36)*
- "False scales are an abomination to the Lord, but an honest weight, his delight." *(Proverbs 11:1)*

Saints, Blessed Individuals, Catholic Clergy and Bishops, Key Lay Catholic Contributors

Patron Saints of Mathematics

- St. Hubert of Liège
- St. Barbara

Catholic Saints with Mathematical Legacies

- St. Isidore of Seville (c. 560–636)
- St. Abbo of Fleury (945–1004)
- St. Albert the Great (1200–1280)

Blessed Individuals

- Blessed Ramon Llull (1232–1315)
- Blessed Nicholas of Cusa (1401–1464)
- Blessed Francesco Faà di Bruno (1825–1888)

Catholic Clergy & Bishops (Mathematicians)

- Bishop Robert Grosseteste (c. 1175–1253)
- Archbishop Thomas Bradwardine (1290–1349)
- Bishop Johannes Müller von Königsberg (1436–1476) – *Also widely known as Regiomontanus.*

Key Lay Catholic Contributors

- Leonardo Bonacci / Leonardo Pisano Bigollo (Fibonacci) (c. 1170–1250)
- Johannes Widmann (1460–1498)
- Gerolamo Cardano (1501–1576)
- René Descartes (1596–1650)
- Pierre de Fermat (1601–1665)
- Blaise Pascal (1623–1662)
- Maria Gaetana Agnesi (1718–1799)
- Augustin-Louis Cauchy (1789–1857)

Contemporary Papacy

- **Pope Leo XIV** (1955–present) – Elected in 2025, he is the first modern "mathematician pope," having earned his Bachelor of Science in Mathematics from Villanova University in 1977 before pursuing theology and canon law.

CODE	CATEGORY	STANDARD	iREADY ASSESSMENT	Newman and Lumen Standards
Geometry Geometry invites students to investigate the spatial dimensions, shapes, and proportions of reality, training their eyes to recognize the aesthetic beauty, structural order, and divine symmetry woven directly into the fabric of nature and art.				
5.G.1	Geometry	1. Graph points on the coordinate plane to solve real-world and mathematical problems. Recognize the beauty of God's handiwork in geometric patterns, shapes, and forms.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2
5.G.2 5.G.2.A	Geometry	2. 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. A. 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).* Example: identify lines and angles within symbols of the Church.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2
5.G.3	Geometry	3. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate not assessed values of points in the context of the situation.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2
5.G.4	Geometry	4. Classify two-dimensional figures into categories based on their properties. Recognize the beauty of God's handiwork in geometric patterns, shapes, and forms. Example: classify two dimensional shapes and lines in stained-glass windows.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2
5.G.5	Geometry	5. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. *(e.g., all rectangles have four right angles and squares are rectangles, so all squares patterns, and relationships have four right angles)*.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2
5.G.6	Geometry	6. Classify two-dimensional figures in a hierarchy based on properties.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2
5.G.7	Geometry	7. Find the area of a rectangle with fractional side lengths.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Geometry	DS1, DS3, DS4 7.1, 7.2

Measurement and Data Mastering measurement and data equips students to quantify and interpret the physical world, transforming abstract numbers into concrete tools for ethical stewardship, responsible resource management, and data-informed service to the common good.				
5.MD.1	Measurement & Data	1. Convert like measurement units within a given measurement system. Recognize God's organization in creation.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Measurement	GS1, GS4, DS2, DS3, DS4, DS5 7.1, 7.2
5.MD.2	Measurement & Data	2. Convert among different-sized standard measurement units within a given measurement system. *(e.g., convert 5 cm to 0.05 m. Use these conversions in solving multi-step, real-world problems).*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Measurement	GS1, GS4, DS2, DS3, DS4, DS5 7.1, 7.2
5.MD.3	Measurement & Data	3. Represent and interpret data.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Data	DS2, DS5 7.1, 7.2
5.MD.4 5.MD.4.A	Measurement & Data	4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). A. Use operations on fractions for this grade to solve problems involving information presented in line plots. *(e.g., given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.)*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Data	DS2, DS5 7.1, 7.2
5.MD.5	Measurement & Data	5. Geometric measurement: Understand concepts of volume.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Measurement Geometry	DS2, DS5 7.1, 7.2
5.MD.6 5.MD.6.A 5.MD.6.B	Measurement & Data	6. Recognize volume as an attribute of solid figures and identify concepts of volume measurement. A. 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. B. 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.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Measurement Geometry	DS5 7.1, 7.2
5.MD.7	Measurement & Data	7. Measure volumes by counting unit cubes, using cubic cm., cubic in., cubic ft., and improvised units.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Measurement Geometry	DS5 7.1, 7.2
5.MD.8 5.MD.8.A	Measurement & Data	8. Relate volume to the operations of multiplication and addition and solve real-world and mathematical problems involving volume. A. 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	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Measurement Geometry	DS5 7.1, 7.2

5.MD.8.B 5.MD.8.C 5.MD.8.D 5.MD.8.E		lengths, equivalently by multiplying the height by the area of the base. B. Represent threefold whole-number products as volumes. *(e.g., to represent the associative property of multiplication.)* C. Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real-world and mathematical problems. D. Recognize volume as additive. E. 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.		
Numbers and Base Ten Operations The study of place value and operations in base ten teaches students to navigate increasingly complex numerical systems with precision, cultivating the essential virtues of patience, accuracy, and intellectual integrity as they seek clarity in their work.				
5.NBT.1	Numbers & Operations in Base Ten	1. Understand the place value system. Recognize God's organization in creation.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	DS5 7.1, 7.2
5.NBT.2	Numbers & Operations in Base Ten	2. Recognize that in a multi-digit number, a digit in the ones 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.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NBT.3 5.NBT.3.A 5.NBT.3.B	Numbers & Operations in Base Ten	*3. Explain patterns in the number of zeroes of the product when multiplying a number by powers of 10.* *A. Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10.* *B. Use whole-number exponents to denote powers of 10.*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	DS5 7.1, 7.2
5.NBT.4	Numbers & Operations in Base Ten	*4. Read, write, round and compare decimals to the thousandths using <, =, > symbols to record the results of comparisons.*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NBT.5	Numbers & Operations in Base Ten	5. Use place value to round decimals to any place.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NBT.6	Numbers & Operations in Base Ten	6. Perform operations with multi-digit whole numbers and with decimals to hundredths.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NBT.7	Numbers & Operations in Base Ten	7. Fluently multiply multi-digit whole numbers using the standard algorithm.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2

5.NBT.8	Numbers & Operations in Base Ten	8. 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.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NBT.9 5.NBT.9.A	Numbers & Operations in Base Ten	9. Add, subtract, multiply, and divide decimals to hundredths. A. Relate the strategy to a written method and explain the reasoning used.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
Number & Operations-Fractions The study of fractions invites students to understand that unity can be found within brokenness and diversity, teaching them that whole entities can be divided into equal parts without losing their relationship to the whole, while cultivating the numerical precision needed to navigate the deeper proportions and hidden complexities of God's creation.				
5.NF.1	Number & Operations-Fractions	1. Use equivalent fractions to add and subtract fractions.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.2	Number & Operations-Fractions	2. 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.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.3 5.NF.3.A	Number & Operations-Fractions	3. 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.)* A. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *(e.g., recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2).*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.4	Number & Operations-Fractions	4. Apply and extend previous understanding of multiplication and division.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.5 5.NF.5.A	Number & Operations-Fractions	5. Interpret a fraction as division of the numerator by the denominator (a/b= a ÷ b). A. 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).*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.6 5.NF.6.A	Number & Operations-Fractions	6. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. A. Interpret the product (a/b) x q as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b. (e.g., use a visual fraction model to show (2/3) x 4 = 8/3, and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. (In general, (a/b) x (c/d) = ac/bd.).	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2

5.NF.7 5.NF.7.A 5.NF.7.B 5.NF.7.C 5.NF.7.D	Number & Operations-Fractions	7. Interpret multiplication as scaling (resizing), by: A. 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. B. 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) C. Explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. D. Relate the principle of fraction equivalence a/b = (n x a)/ (n x b) to the effect of multiplying a/b by 1.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.8	Number & Operations-Fractions	8. Solve real-world problems involving multiplication of fractions and missed numbers by using visual fraction models or equations to represent the problem.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
5.NF.9 5.NF.9.A 5.NF.9.B 5.NF.9.C 5.NF.9.D 5.NF.9.E	Number & Operations-Fractions	9. Apply and extend previous knowledge of division to divide unit fractions by whole numbers and whole numbers by unit fractions. A. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *(e.g., create a story context for (1/3) + 4, and use a visual fraction model to show the quotient)* B. Use the relationship between multiplication and division to explain that (1/3) + 4 = 1/12 because (1/12) x 4 = 1/3. C. Interpret division of a whole number by a unit fraction, and compute such quotients. *(e.g., create a story context for 4 + (1/5), and use a visual fraction model to show the quotient)* D. Use the relationship between multiplication and division to explain that 4 + (1/5) = 20 because 20 x (1/5) = 4. E. 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.)*	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS4, DS3, DS5 7.1, 7.2
Operations and Algebraic Thinking Operations and algebraic thinking invite students to explore the unyielding laws of cause, effect, and relationship, developing the logical reasoning and perseverance needed to solve complex problems and find balance, harmony, and objective truth within a structured world.				
5.OA.1	Operations & Algebraic Thinking	1. Use the order of operations which include parentheses, brackets or braces in numerical expressions and write/interpret simple expressions that record calculations with numbers without evaluating them. Recognize the beauty of God's truth in mathematical laws. Example: PEMDAS = Pray Each Moment During All Seasons.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS2, DS5 7.1, 7.2

5.OA.2	Operations & Algebraic Thinking	2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Numbers and Operations	GS2, DS5 7.1, 7.2
5.OA.3	Operations & Algebraic Thinking	3. Analyze patterns and relationships.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Algebra and Algebraic Thinking	GS2, DS5 7.1, 7.2
5.OA.4 5.OA.4.A 5.OA.4.B	Operations & Algebraic Thinking	4. Generate two numerical patterns using two given rules. A. Identify apparent relationships between corresponding terms. B. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.	8.1, 8.2, 8.4, 8.5, 9.1 Assessed Algebra and Algebraic Thinking	GS2, DS5 7.1, 7.2