



Archdiocese of Newark Catholic Schools

Curriculum Mapping

Curriculum mapping is a process that helps schools and districts/dioceses determine the “agreed-upon” learning for all students. Curriculum mapping was undertaken in the Archdiocese of Newark in order to ensure that a consistent, clearly articulated curriculum infused with Gospel values is being provided to all students in our schools. The curriculum maps for the Catholic schools of the Archdiocese of Newark identify the content to be taught and skills to be mastered at each grade level.

The expertise and experience of the educators within our schools is the main source for determining the content and skills students will be expected to master. The Archdiocesan curriculum maps are developed through a collaborative process which involves individual teacher contributions, small group sessions and larger group meetings. Relevant educational standards, including those proposed by content area experts, the New Jersey Core Curriculum Content Standards, and the Common Core State Standards, are used as a resource in the curriculum mapping process. The resulting consensus maps reflect the collective thinking of classroom teachers based on their observation of student learning and their knowledge of educational practice and research. The Archdiocesan curriculum maps include teacher generated ideas for the infusion of Gospel values and faith connection activities.

While the curriculum maps clearly articulate the expected learning for all students, individual teachers have the flexibility to teach the content and skills in their own manner by:

- ◆ utilizing their own particular strengths and teaching style
- ◆ addressing the varying learning needs of their students
- ◆ determining the order in which the content and skills are presented within a marking period
- ◆ including additional content and skills once students have met the learning expectations identified in the curriculum map

Administrators at all levels will maintain the responsibility to ensure that teachers are following the curriculum maps and that appropriate teaching is being conducted. This will be done through a combination of classroom observations, faculty meetings, professional development opportunities and teacher evaluations, as well as by using various measurement tools, including but not limited to in-class and standardized testing. The Archdiocesan curriculum maps will help ensure the academic excellence that is integral to the mission of our Catholic schools and will provide educators and parents with a clear understanding of the learning expectations at each grade level.

Archdiocese of Newark Catholic Schools
Curriculum Map for Mathematics
Pre-Algebra (Grade 7 or 8)

First Trimester: September-November

Standards	Content	Skills	Assessment	Gospel Values & Faith Connections
<p>7.EE.S1 Apply the rule for Order of Operations to solve numerical and algebraic equations and to simplify and evaluate expressions.</p> <p>7.EE.4 Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>7.NS.1 Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.</p> <p>7.NS.2 Apply and extend previous understandings of multiplication, division, and fractions to multiply and divide rational numbers.</p> <p>7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.</p> <p>7.EE.2 Understand that rewriting an expression in different forms may enhance the interpretation of the problem and how the quantities in it are related.</p>	<p>Variables and Algebraic Expressions</p>	<p>Evaluate algebraic expressions.</p> <p>Translate verbal phrases into algebraic expressions.</p> <p>Identify and use properties of addition and multiplication.</p> <p>Use properties of addition and multiplication to simplify algebraic expressions.</p> <p>Apply order of operations to expressions with rational numbers.</p>	<p>Student learning will be assessed on a continual basis using various types of formal and informal assessments. A list of possible assessment methods is provided below:</p> <p>Chapter Tests</p> <p>Quizzes</p> <p>Homework Assignments</p> <p>Cumulative Assessments</p> <p>In-class Observations</p> <p>Projects</p> <p>Writing in Math</p> <p>Mental Math Assessments</p> <p>Math Discussions</p> <p>Group Interaction/Work</p> <p>Math Games</p> <p>Teacher for the Day</p> <p>Student Response Systems</p> <p>Board Work</p> <p>Online Math Programs</p> <p>Worksheets</p>	<p>Gospel values should be evident in the classroom environment and referenced and reinforced throughout the curriculum.</p> <p>Gospel Values</p> <p>Community</p> <p>Compassion</p> <p>Faith in God</p> <p>Forgiveness</p> <p>Hope</p> <p>Justice</p> <p>Love</p> <p>Peace</p> <p>Respect For Life</p> <p>Service</p> <p>Simplicity</p> <p>Truth</p> <p>Included in this column are several suggestions for making faith connections within the Math classroom. These suggestions were submitted by teachers.</p>

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First Trimester: September-November

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<p>7.NS.1b Understand $p + q$ as the number located a distance q from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of zero (additive inverses). Interpret sums of rational numbers by describing real world contexts.</p> <p>7.NS.1c Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real world contexts.</p> <p>7.NS.2 Apply and extend previous understandings of multiplication, division, and fractions to multiply and divide rational numbers.</p> <p>a) Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real world contexts.</p>	<p>Rational Numbers</p>	<p>Add and subtract rational numbers.</p> <p>Multiply and divide rational numbers.</p> <p>Write rational numbers as fractions.</p> <p>Identify and classify rational numbers.</p> <p>Express repeating decimals as fractions using the equation.</p> <p>Solve equations involving rational numbers.</p> <p>Solve inequalities involving rational numbers.</p> <p>Evaluate squares and square and cubed roots.</p>		

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<p>b) Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then: $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts.</p> <p>c) Apply properties of operations as strategies to multiply and divide rational numbers.</p> <p>7.NS.S3 Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.</p> <p>8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.</p> <p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to</p>				

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<p>calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p> <p>7.EE.4 Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares (at least up to 225) and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.</p> <p>7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.</p>	<p style="text-align: center;">Properties of Real Numbers</p>	<p>Demonstrate knowledge of all properties of real numbers including Identity, Zero, Distributive, Associative, Commutative, and Equality with regard to addition and multiplication.</p>		

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Second Trimester: December-February

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<p>7.G.5 Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p> <p>8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.</p> <p>7.G.2 Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p>	<p>Angles</p> <p>Lines</p> <p>Triangles</p> <p>Polygons</p>	<p>Classify and name figures including points, lines, planes, and angles.</p> <p>Identify parallel and perpendicular lines.</p> <p>Identify the relationship between parallel and intersecting lines.</p> <p>Find unknown angles in triangles.</p> <p>Classify triangles by properties and attributes.</p> <p>Classify and find angles in polygons.</p> <p>Determine the sum of the measures of the interior and exterior angles of a polygon.</p>	<p>Student learning will be assessed on a continual basis using various types of formal and informal assessments. A list of possible assessment methods is provided below:</p> <ul style="list-style-type: none"> Chapter Tests Quizzes Homework Assignments Cumulative Assessments In-class Observations Projects Writing in Math Mental Math Assessments Math Discussions Group Interaction/Work Math Games Teacher for the Day Student Response Systems Board Work 	<p>Gospel values should be evident in the classroom environment and referenced and reinforced throughout the curriculum.</p> <p>Gospel Values</p> <ul style="list-style-type: none"> Community Compassion Faith in God Forgiveness Hope Justice Love Peace Respect For Life Service Simplicity Truth <p>Included in this column are several suggestions for making faith connections within the Math classroom. These suggestions were submitted by teachers.</p>

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<p>8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</p> <p>8.G.1 Verify experimentally the properties of rotations, reflections, and translations:</p> <ul style="list-style-type: none"> a) Lines are taken to lines, and line segments to line segments of the same length. b) Angles are taken to angles of the same measure. c) Parallel lines are taken to parallel lines. 	<p>Coordinate Geometry</p> <p>Congruence</p> <p>Transformations</p> <p>Symmetry</p>	<p>Determine the slope of parallel and perpendicular lines.</p> <p>Identify polygons in the coordinate plane</p> <p>Identify congruent triangles and corresponding parts of congruent triangles.</p> <p>Transform plane figures using translations, rotations, reflections, and symmetry.</p> <p>Identify symmetry in figures.</p>	<p>Online Math Programs</p> <p>Worksheets</p> <p>Vocabulary</p> <p>Standardized Testing</p> <p>Final Exams</p> <p>Performance Tasks</p> <p>Summer Packets</p>	<p>Look for patterns, symmetry, angle measure, etc. in stained glass windows and religious architecture.</p>

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<p>7.G.6 Solve real world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p> <p>8.G.7 Apply the Pythagorean Theorem to determine the unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.</p> <p>7.G.4 Know the formulas for the area and circumference of a circle and use them to solve problems. Give an informal derivation of the relationship between the circumference and area of a circle.</p> <p>7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p>	<p>Perimeter and Area</p> <p>Pythagorean Theorem</p> <p>Circles</p> <p>Volume</p>	<p>Apply formulas to find perimeter and area of rectangles, parallelograms, triangles, trapezoids.</p> <p>Calculate area of complex figures.</p> <p>Recognize right triangles and apply the Pythagorean Theorem to problems involving right triangles.</p> <p>Calculate the circumference and area of circles.</p> <p>Compare three-dimensional figures and describe two-dimensional figures resulting from slicing three-dimensional figures.</p>		

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Second Trimester: December-February

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<p>7.G.6 Solve real world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p> <p>8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares (at least up to 225) and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.</p> <p>8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.</p> <p>7.RP.1 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.</p> <p>7.RP.2 Recognize and represent proportional relationships between quantities. a) Decide whether two quantities are in a proportional relationship, e.g.,</p>	<p>Ratios and Proportions</p>	<p>Investigate volume by creating and comparing containers of various shapes.</p> <p>Calculate volume of prisms, pyramids, cylinders, cones, spheres.</p> <p>Apply formulas to find surface area of three-dimensional figures.</p> <p>Use division to find unit rates and ratios in proportional relationships.</p> <p>Solve proportions and ratios.</p>		

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<p>8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.</p> <p>8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p> <p>7.RP.2 Recognize and represent proportional relationships between quantities.</p> <p>a) Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p>	<p>Scale Drawings</p>	<p>Solve problems involving indirect measurement using similar triangles.</p> <p>Find solutions to applications problems involving other proportional relationships such as similarity.</p>		<p>Scale</p> <p>When working with problems involving scale use places and things that are part of our Catholic faith such as the Sistine chapel or Vatican City or holy places in Jerusalem.</p>

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<p>b) Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c) Represent proportional relationships by equations.</p> <p>7.G.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a drawing at a different scale.</p> <p>7.G.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.</p>	<p>Word Problems: Strategies & Applications in all topics</p>	<p>Make comparisons between and find dimensions of scale drawing and actual objects.</p> <p>Describe two dimensional figures resulting from slicing three dimensional figures.</p> <p>Compare and contrast proportional and non-proportional linear relationships.</p> <p>Develop and apply strategies to solve real-life word problems.</p>		<p>Develop word problems involving social justice issues.</p>

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Pre-Algebra (Grade 7 or 8)

Third Trimester: March - June

Standards	Content	Skills	Assessment	Gospel Values & Faith Connections
<p>8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.</p> <p>8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2).</p> <p>7.SP.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.</p>	<p>Squares and Square roots</p> <p>Real Numbers</p> <p>Samples and Surveys</p>	<p>Find square roots and squares.</p> <p>Define real numbers.</p> <p>Determine if a number is rational or irrational.</p> <p>Locate irrational and rational numbers on a number line.</p> <p>Create and investigate samples and surveys.</p> <p>Determine the validity of a sample and predict the actions of a larger group.</p>	<p>Student learning will be assessed on a continual basis using various types of formal and informal assessments. A list of possible assessment methods is provided below:</p> <ul style="list-style-type: none"> Chapter Tests Quizzes Homework Assignments Cumulative Assessments In-class Observations Projects Writing in Math Mental Math Assessments Math Discussions Group Interaction/Work Math Games Teacher for the Day Student Response Systems Board Work Online Math Programs 	<p>Gospel values should be evident in the classroom environment and referenced and reinforced throughout the curriculum.</p> <p>Gospel Values</p> <ul style="list-style-type: none"> Community Compassion Faith in God Forgiveness Hope Justice Love Peace Respect For Life Service Simplicity Truth <p>Included in this column are several suggestions for making faith connections within the Math classroom. These suggestions were submitted by teachers.</p>

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Pre-Algebra (Grade 7 or 8)

Third Trimester: March - June

Standards	Content	Skills	Assessment	Gospel Values & Faith Connections
<p>7.RP.3 Use proportional relationships to solve multi-step ratio and percent problems. <i>Examples: Simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent of change (increase and decrease), percent error.</i></p> <p>7.NS.S3. Compare and order fractions, decimals, and percents efficiently and find their approximate locations on a number line.</p>	<p>Percent Increase and Decrease</p> <p>Interest</p> <p>Percents</p>	<p>Calculate the percent of increase or decrease.</p> <p>Calculate and compare simple and compound interest.</p> <p>Relate decimals, fractions, and percents.</p> <p>Use a percent model to find a percent or a part.</p> <p>Use percent proportions and equations to find the percent of a number, what percent a number is of another, and the whole when the percent or part is given.</p>		<p>When working with problems involving percent of increase or decrease use statistics related to the Catholic Church or parish.</p>

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Third Trimester: March - June

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<p>7.EE.3 Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.</p> <p>7.EE.4 Use variables to represent quantities in a real world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.</p> <p>8.EE.7 Solve linear equations in one variable.</p> <p>a) Give examples of linear equations in one variable with one solution ($x = a$), infinitely many solutions ($a = a$), or no solutions ($a = b$ where a and b are different numbers). Show which of these possibilities is the case by successively transforming the given equation into simpler forms.</p> <p>b) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the</p>	<p>Multi-step Equations and Inequalities</p>	<p>Solve two-step and multi-step inequalities that involve more than one operation.</p> <p>Apply appropriate operations to solve equations that involve more than one operation.</p> <p>Identify relations and functions.</p> <p>Identify domain and range of a function.</p> <p>Find and graph the solution of a function.</p> <p>Find the slope of a linear function.</p> <p>Determine the x and y intercepts of a line from a graph.</p> <p>Translate a graphed line to an equation in slope-intercept form given two points.</p>		

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<p>distributive property and collecting like terms.</p> <p>8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.</p> <p>8.EE.S1 Recognize and understand the forms of linear equation: slope-intercept form as $y = mx + b$, and standard form as $Ax + By = C$.</p> <p>7.EE.4a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach.</p> <p>7.EE.4b Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.</p>	<p>Word Problems: Strategies and Applications in all topics</p>	<p>Solve equations with variables on both sides.</p> <p>Solve for a variable.</p> <p>Recognize a system of equations.</p> <p>Recognize and create scatter plots.</p> <p>Develop and apply strategies to solve real-life word problems.</p>		