Catholic Schools
DIOCESE OF DALLAS

Snapshot – Grade 8 Math

Catholic Identity: Integration of Our Faith

8.1A	display a sense of wonder about mathematical relationships *
8.1B	respond to the beauty, harmony, proportion, radiance, and wholeness present in mathematics *
8.1C	show interest in how the mental processes evident within mathematics help us with the development of natural virtues *
8.1D	exhibit appreciation for the process of discovering meanings and truths and not just arriving at an answer *

Mathematical Learning Process Standards

8.2 **Learning Process Standards.** The student uses mathematical processes to acquire and demonstrate mathematical understanding, demonstrating the mental habits of precise, determined, careful, and accurate questioning, inquiry, and reasoning. *

Tools to Know		Ways to Show	
8.2A	apply mathematics to problems arising in everyday life, society, and the workplace	8.2D	create and use representations to organize, record, and communicate mathematical ideas
8.2B	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	8.2E	analyze mathematical relationships to connect and communicate mathematical ideas
8.2C	exhibit habits of thinking quantitatively and in an orderly manner, especially through immersion in mathematical observations found within creation *	8.2F	exhibit appreciation for the ongoing nature of mathematical inquiry and develop lines of inquiry to understand why things are true and why they are false *

Real Number Relationships

8. 3 **Place Value.** The student represents and uses real numbers in a variety of forms.

Applied Standards		Supporting Standards	
8.3A	extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers	8.3A.1	convert between standard decimal notation and scientific notation
8.3B	order a set of real numbers arising from mathematical and real-world contexts	8.3B.1	approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line

Proportional and Non-Proportional Reasoning

8.5 **Proportionality.** The student uses proportional and non-proportional relationships involving slope and to develop foundational concepts of functions.

8.5A	identify functions using sets of ordered pairs, tables, mappings, and graphs		
8.5B	solve problems involving direct variation	8.5B.1	represent linear proportional situations with tables, graphs, and equations in the form of y = kx
8.5C	write an equation in the form y = mx + b to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations	8.5C.1	represent linear non-proportional situations with tables, graphs, and equations in the form of y = mx + b, where b ≠ 0
		8.5C.2	distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form y = kx or y = mx + b, where b ≠ 0
		8.5C.3	identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems
8.5D	use data from a table or graph to determine the rate of change or slope and y-intercept in mathematical and real-world problems	8.5D.1	use similar right triangles to develop an understanding that slope, m, given as the rate comparing the change in y-values to the change in x-values, (y2 – y1) / (x2 – x1), is the same for any two points (x1, y1) and (x2, y2) on the same line
		8.5D.2	graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship

** Source: CATHOLIC CURRICULAR STANDARDS AND DISPOSITIONS IN MATHEMATICS 7-12, Cardinal Newman Society*

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Transformational Geometry		
8.6	**Geometry and measurement.** The student develops transformational geometry concepts.	
8.6A	explain the effect of translations, reflections over the x- or y-axis, and rotations limited to 90°, 180°, 270°, and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation	8.6A.1 generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane 8.6A.2 differentiate between transformations that preserve congruence and those that do not
8.6B	use an algebraic representation to explain the effect of a given positive rational scale factor applied to two-dimensional figures on a coordinate plane with the origin as the center of dilation	8.6B.1 compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane 8.6B.2 model the effect on linear and area measurements of dilated two-dimensional shapes

Triangles		
8.6	**Geometry and measurement.** The student uses geometry to solve problems involving triangles.	
8.6C	use the Pythagorean theorem and its converse to solve problems	8.6C.1 use models and diagrams to explain the Pythagorean theorem 8.6C.2 determine the distance between two points on a coordinate plane using the Pythagorean theorem
8.6D	use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles	

Surface Area and Volume		
8.6	**Geometry and measurement:** The student uses geometry to solve problems for surface area and volume.	
8.6E	use previous knowledge of surface area to make connections to the formulas for lateral and total surface area and determine solutions for problems involving rectangular prisms, triangular prisms, and cylinders	
8.6F	solve problems involving the volume of cylinders, cones, and spheres	8.6F.1 describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height 8.6F.2 model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas

Data Analysis		
8.7	**Data analysis.** The student uses statistical procedures to describe data.	
8.7A	use a trend line that approximates the linear relationship between bivariate sets of data to make predictions	8.7A.1 contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation 8.7A.2 construct a scatterplot and describe the observed data to address questions of association such as linear, nonlinear, and no association between bivariate data 8.7A.3 determine the mean absolute deviation 8.7A.4 simulate generating random samples of the same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which it was selected

Equations and Inequalities		
8.8	**Expressions, equations, and relationships.** The student uses multiple representations to develop foundational concepts of simultaneous linear equations	
8.8A	model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants	8.8A.1 write equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants 8.8A.2 write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants 8.8A.3 identify and verify the values of x and y that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations