Maryland
STATE DEPARTMENT OF EDUCATION

DRAFT Math 8 Standards

Maryland College and Career Ready Standards for Mathematics

Standards Crosswalk Document

Mathematics Branch

May 2025

Number and Operation Sense (NOS)

Previously The Number System (NS)

8.NOS.A REASON WITH IRRATIONAL NUMBERS.

PREVIOUSLY 8.NS.A KNOW THAT THERE ARE NUMBERS THAT ARE NOT RATIONAL, AND APPROXIMATE THEM BY RATIONAL NUMBERS.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.NOS.A.1	Identify a number as irrational when its decimal expansion neither terminates nor repeats, and explain that irrational numbers cannot be expressed as the ratio of two integers.	**8.NS.A.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.
8.NOS.A.2	Use rational approximations of irrational numbers to estimate their locations on a number line, compare their size, and apply this understanding to estimate the value of expressions (e.g., π^2) in context.	**8.NS.A.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). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

8.NOS.B REASON WITH EXPONENTS TO EXPRESS AND INTERPRET QUANTITIES.

PREVIOUSLY 8.EE.A EXPRESSIONS AND EQUATIONS WORK WITH RADICALS AND INTEGER EXPONENTS.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.NOS.B.3	Know and apply the properties of integer exponents to generate equivalent numerical expressions.	**8.EE.A.1**	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = \frac{1}{3^3} = \frac{1}{27}$.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.NOS.B.4	Use square and cube roots to solve equations and describe numbers a. Use square and cube roots symbols to represent solutions to equations of the form $x^2=p$ and $x^3=p$, where p is a positive rational number. b. Evaluate square roots of perfect squares from 1 to 100 and cube roots of perfect cubes from 1 to 125 by inspection.	**8.EE.A.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 and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.
8.NOS.B.5	Apply scientific notation to represent and compare very large and very small quantities in context, and use technology to compute with numbers in scientific notation. a. Express numbers as a single digit times an integer power of 10 to estimate and compare magnitudes. b. Use scientific notation to model and compute with real-world quantities, choose appropriate units, and interpret their meaning based on the context.	**8.EE.A.3**	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 times 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger.
[Not applicable]	[Not included as a standard]	**8.EE.A.4**	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Algebraic Thinking (AT)

Previously Expressions and Equations (EE); Functions (F)

8.AT.A USE PROPORTIONAL RELATIONSHIPS TO UNDERSTAND AND REPRESENT LINEAR EQUATIONS.

PREVIOUSLY 8.EE.B UNDERSTAND THE CONNECTIONS BETWEEN PROPORTIONAL RELATIONSHIPS, LINES, AND LINEAR EQUATIONS.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.AT.A.1	Analyze and compare proportional relationships using slope. a. Graph proportional relationships and interpret the unit rate as the slope of the graph. b. Compare proportional relationships represented in different forms (e.g., graphs, equations, and tables) by analyzing their unit rates.	**8.EE.B.5**	Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.
8.AT.A.2	Use proportional reasoning to identify slope and represent linear relationships. a. Use proportional reasoning to explain why the slope *m* is the same between any two points on a non-vertical line by showing that the ratios of vertical change to horizontal change between points are equivalent. b. Use this relationship to write equations of lines in the form $y=mx$ for lines that pass through the origin, and in the form $y=mx+b$ for lines that include a vertical shift from the origin, where b represents the y-intercept.	**8.EE.B.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.

8.AT.B MAKE SENSE OF AND SOLVE EQUATIONS, INEQUALITIES, AND SYSTEMS OF EQUATIONS.
PREVIOUSLY 8.EE.C ANALYZE AND SOLVE LINEAR EQUATIONS AND PAIRS OF SIMULTANEOUS LINEAR EQUATIONS.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.AT.B.3	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solution. Justify each example by showing how it can be rewritten in an equivalent equation in the form *x*=a, a=a, or a=b (where a and b are different rational numbers) and explaining what this form reveals about the solution. b. Solve linear equations in one variable with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	**8.EE.C.7**	Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = a, a=a, or a=b results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.AT.B.4	Solve linear inequalities in one variable. a. Solve inequalities including those requiring the use of the distributive property and combining like terms. b. Represent the solution set on a number line and describe the set of possible values in the context of the problem.	[New standard]	[New standard]
8.AT.B.5	Analyze and solve systems of two linear equations in two variables. a. Interpret the solution to a system of two linear equations as the point where their graphs intersect and verify that the coordinates of the intersection satisfy both equations.	**8.EE.C.8**	Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
	b. Solve systems of two linear equations by graphing and substitution. When using graphing, find an approximate or exact solution depending on the precision of the graph. Select a method strategically based on the structure of the system or the context of the problem and explain why the method is appropriate. c. Use structure to determine when a system has no solution, one solution, or infinitely many solutions and justify the conclusion. d. Model and solve contextual problems using systems of two linear equations.		b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, $3x+2y=5$ and $3x+2y=6$ have no solution because $3x+2y$ cannot simultaneously be 5 and 6. c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

8.AT.C REASON ABOUT FUNCTIONS.

PREVIOUSLY 8.F.A DEFINE, EVALUATE, AND COMPARE FUNCTIONS.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.AT.C.6	Determine whether a relationship is a function by analyzing whether each input is assigned to exactly one output. a. Given a clearly defined set of input-output pairs in a table, mapping, or real-world description, determine whether the relationship is a function and explain why. b. Given a graph, identify input-output pairs and determine whether the graph represents a function.	**8.F.A.1**	Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.
8.AT.C.7	Compare the properties (i.e., rate of change, intercepts) of two linear functions each represented	**8.F.A.2**	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
	in a different way (algebraically, graphically, numerically in tables, or by narrative descriptions).		represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.
8.AT.C.8	Identify whether a function is linear or non-linear given equations, graphs, or input-output pairs, and provide a justification.	**8.F.A.3**	Interpret the equation $y=mx+b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A=s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

8.AT.D MODEL WITH FUNCTIONS.

PREVIOUSLY 8.F.B USE FUNCTIONS TO MODEL RELATIONSHIPS BETWEEN QUANTITIES.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.AT.D.9	Interpret the graph of a linear function in the form $y=mx+b$ a. Given the graph of a linear function, identify the slope and y-intercept. b. Match a linear equation in the form $y=mx+b$ to its graph.	[New standard]	[New standard]
8.AT.D.10	Construct and interpret a linear function to model a relationship between two quantities. a. Given two input-output pairs, a graph, a table, or a description of a relationship, determine the rate of change and initial value and write the linear equation that models the situation.	**8.F.B.4**	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
	b. Interpret the rate of change and initial value in the context of the problem.		
8.AT.D.11	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function based on a narrative description.	**8.F.B.5**	Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Geometric Reasoning (GR)

Previously Geometry (G)

8.GR.A CONJECTURE ABOUT AND VERIFY GEOMETRIC RELATIONSHIPS.

PREVIOUSLY 8.G.A UNDERSTAND CONGRUENCE AND SIMILARITY USING PHYSICAL MODELS, TRANSPARENCIES, OR GEOMETRIC SOFTWARE; 7.G.A DRAW, CONSTRUCT, AND DESCRIBE GEOMETRIC FIGURES AND DESCRIBE THE RELATIONSHIP BEWEEN THEM; 7.G.B SOLVE REAL-LIFE AND MATHEMATICAL PROBLEMS INVOLVING ANGLE MEASURE, AREA, SURFACE AREA, AND VOLUME.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.GR.A.1	Use the relationships between supplementary, complementary, vertical, and adjacent angles to write and solve equations for an unknown angle.	**7.G.B.5**	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve equations for an unknown angle in a figure.
8.GR.A.2	Draw or build triangles using tools (ruler, protractor, technology, or physical manipulatives) given three measures of angles or sides. Determine whether the given conditions result in a unique triangle, more than one triangle, or no triangle.	**7.G.A.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.
8.GR.A.3	Use informal arguments to verify that the sum of the interior angles of a triangle is 180 degrees and why an exterior angle equals the sum of the two remote interior angles.	**8.G.A.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~~. [Int Alg 1 & 2]. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.
[Not applicable]	[In Integrated Algebra 1]	**8.G.A.1**	Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines; line segments to line segments of the same length.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
			b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.
[Not applicable]	[In Integrated Algebra 1]	**8.G.A.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.
[Not applicable]	[In Integrated Algebra 1 & 2]	**8.G.A.3**	Describe the effect of dilations, translations, rotations, and reflections on two dimensional figures using coordinates.
[Not applicable]	[In Integrated Algebra 2]	**8.G.A.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.

8.GR.B APPLY THE PYTHAGOREAN THEOREM TO REASON ABOUT RIGHT TRIANGLES.
PREVIOUSLY 8.G.B UNDERSTAND AND APPLY THE PYTHAGOREAN THEOREM.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.GR.B.4	Understand and reason about the Pythagorean Theorem and its extensions. a. Use diagrams, examples, or informal reasoning to explain the Pythagorean Theorem and why it applies to all right triangles. b. Use the converse of the Pythagorean Theorem to determine whether a set of three side lengths forms a right triangle, and	**8.G.B.6**	Explain a proof of the Pythagorean Theorem and its converse.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
	extend this reasoning to identify whether a triangle is acute or obtuse using Pythagorean inequalities.		
8.GR.B.5	Apply the Pythagorean Theorem to solve problems in context. a. Determine unknown side lengths in right triangles. b. Find the distance between two points in a coordinate system using the Pythagorean Theorem.	**8.G.B.7** **8.G.B.8**	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.
[Not applicable]	[In Math 7]	**8.G.C.9**	Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Reasoning with Data, Statistics, and Probability (DS)

Previously Statistics & Probability (SP)

8.DS.A DESCRIBE, ANALYZE, AND COMPARE DATA USING VISUAL AND NUMERICAL REPRESENTATIONS TO MODEL SITUATIONS AND DRAW INFERENCES.

PREVIOUSLY 8.SP.A INVESTIGATE PATTERNS OF ASSOCIATION IN BIVARIATE DATA.

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.DS.A.1	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	**8.SP.A.1**	Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.
8.DS.A.2	Compare the fit of different linear models shown on scatter plots of the same data by describing the overall pattern and the closeness of data points to each line.	**8.SP.A.2**	Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.
8.DS.A.3	Use a provided linear model to make predictions based on bivariate measurement data. Interpret the meaning of the slope and y-intercept in context.	**8.SP.A.3**	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm per hour as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

8.DS.B MODEL AND ANALYZE PROBABILITY TO INTERPRET CHANCE EVENTS AND MAKE PREDICTIONS.
NEW CLUSTER

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
8.DS.B.4	Construct a two-way table to organize data on two categorical variables collected from the same subjects. Calculate and interpret relative frequencies for rows and/or columns and use them to describe possible associations between the variables.	**8.SP.A.4**	Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?
8.DS.B.5	Find probabilities of compound events by representing or simulating the sample space or simulating events. a. Determine the probability of a compound event as a fraction of outcomes in the sample space that result in the event. b. Represent the sample space for a compound event using organized lists, tables, or tree diagrams. Given an event described in everyday language, identify the outcomes in the sample space that make up the event.	**7.SP.C.8**	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is

2025 MD Index	2025 Standards Statement	2010 Index	2010 Previous Standards Statement
			the probability that it will take at least 4 donors to find one with type A blood?