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Grade 8: PA Academic Eligible Content and PA Common Core Crosswalk

Alignment of Eligible Content: More than Just Content

The crosswalk below is designed to show the alignment between the PA Academic Standard Eligible Content and the PA Common Core Eligible Content. While content is in many cases similar, the **key message is that PA Common Core focused instruction is more rigorous and will prepare students for upcoming PSSAs and future PA Common Core aligned PSSAs.**

The defining element of the PA Common Core Standards is one of rigor. Barbara Blackburn elaborates on the concept of rigor when she states: "True rigor is creating an environment in which each student is expected to learn at high levels, each student is supported so he or she can learn at high levels, and each student demonstrates learning at high levels.[1]"

Focus on PA Common Core

As instruction segues from the PA Academic Standards to the PA Common Core Standards, it is important to understand the need to prepare students for the current and upcoming PA CC-aligned PSSAs and to consider not only the content but the degree of rigor embraced by the new standards. Instructional time should focus on three critical areas: (1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations; (2) grasping the concept of a function and using functions to describe quantitative relationships; (3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

PA Common Core – Raising the Bar

Educators will note that the items developed to measure the new Assessment Anchors and Eligible Content (Common Core aligned AA/EC) will differ from the current PSSA items in both rigor and difficulty. This will be a direct result of the rigor of the new Assessment Anchors and Eligible Content where the average Depth of Knowledge (DOK) will be higher than the DOK of the existing PSSA Assessment Anchors and Eligible Content. As a result, educators should see items written at the higher cognitive levels (e.g., level 2 and level 3). However, that does not mean that a DOK level 1 item will not be found on the transitioned PSSA. For example, an item measuring math fluency is typically written at DOK level 1. For reading, there may be a vocabulary AA/EC that allows for an item to be written at DOK 1.

Regardless of the increased rigor of the items measuring the new Assessment Anchors and Eligible Content (Common Core aligned AA/EC), educators will also perceive the difficulty of the assessment to have increased.

Eye on the Standards

It is important to remember that while Assessment Anchors and Eligible Content provide the blueprint for the PSSA assessments, they are a reflection only of what can be assessed in large scale testing and do not reflect all of classroom instruction.

[1] Barbara Blackburn, *Rigor and the Common Core State Standards*, mailto:http://www.educationworld.com/a_admin/rigor-and-common-core-state-standards.shtml (January 2013)

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PA Academic Standards Eligible Content ----------	PA Common Core Standards Eligible Content ----------	Comment
M8.A Numbers and Operations	**M08.A-N The Number System**	
M8.A.1.1.1 Represent numbers using scientific notation and/or exponential forms.	**M08.A-N.1.1.1** Determine whether a number is rational or irrational. For rational numbers, show that the decimal expansion terminates or repeats (limit repeating decimals to thousandths). **M08.B-E.1.1.4** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in 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 (e.g., interpret 4.7EE9 displayed on a calculator as 4.7 × 109.	PACCS performs operations with numbers in scientific notation Use numbers in scientific notation to make estimates
M8.A.1.1.2 Find the square or cube of a whole number (single digit) and/or the square root of a perfect square (without a calculator) and explain the relationship between the two (i.e. square and square root).	**M08.A-N.1.1.3** Estimate the value of irrational numbers without a calculator (limit whole number radicand to less than 144). Example: √5 is between 2 and 3 but closer to 2. **M08.B-E.1.1.1** Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Properties will be provided. Example: 312 × 3 –15 = 3 –3 = 1/27.	PACCS performs operations with numbers in scientific notation Use numbers in scientific notation to make estimates
M8.A.2.1.1 Simplify numeric expressions involving integers, using the order of operations. (May include all types of grouping symbols. No combining negatives with exponents [4-3] or compound exponents).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.A.2.2.1 Solve problems involving percent's (e.g., tax, discounts, etc.) Do not include percent increase or decrease.	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.A.2.2.2 Represent or solve rate problems (e.g., unit rates, simple interest, distance, etc.) Students may be asked to solve for any	**M08.B-E.2.1.1** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different	PACCS uses the slope for different types of problems than PA Academic

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term (formulas provided on the reference sheet for distance and interest).	proportional relationships represented in different ways. Example: Compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. **M08.B-E.2.1.2** Use similar right triangles to show and explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.	
M8.A.3.1.1 Identify, use and/or explain when it is appropriate to round up or round down.	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.A.3.1.2 Identify, apply and/or explain when an exact answer is needed or when estimation is appropriate.	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.A.3.2.1 Estimate answers to problems involving percent's (percent's will be limited to: 1%, 10%, 15%, 20%, 25%, 50% or 75%).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content.
M8.A.3.3.1 Add, subtract, multiply and/or divide integers, fractions and/or decimals with and without a calculator (straight computation or word problems).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
Intentionally Blank	**M08.A-N.1.1.2** Convert a terminating or repeating decimal into a rational number (limit repeating decimals to thousandths).	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
Intentionally Blank	**M08.A-N.1.1.4** Use rational approximations of irrational numbers to compare and order irrational numbers.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
Intentionally Blank	**M08.A-N.1.1.5** Locate/identify rational and irrational numbers at their approximate	Not specifically addressed in PA Academic Standard Eligible

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	locations on a number line.	Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed
Intentionally Blank	**M08.B-E.1.1.2** Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of perfect squares (up to and including 122) and cube roots of perfect cubes (up to and including 53) without a calculator. Example: If x2 = 25 then x = ±√25.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
Intentionally Blank	**M08.B-E.1.1.3** Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10, and express how many times larger or smaller one number is than another. Example: Estimate the population of the United States as 3 × 108 and the population of the world as 7 × 109, and determine that the world population is more than 20 times larger than the United States population	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
M8.B Measurement		
M8.B.1.1.1 Convert among metric measurements (milli, centi, kilo using meter, liter and gram) (table of equivalency provided on the reference sheet).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.1.1.2 Convert customary measurements up to 2 units above or below the given unit (e.g., inches to yards, pints to gallons) (table of equivalency provided on the reference sheet).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.1.1.3 Convert time up to 2 units above or below given unit (e.g., seconds to hours).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.1.1.4 Convert from Fahrenheit to Celsius or Celsius to Fahrenheit (formulas provided on the reference sheet).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.2.1.1 Determine the total number of	Intentionally Blank	Not specifically addressed in

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degrees in the interior angles of a polygon in 3 - 8 sided figures (formula provided on the reference sheet).		PACCS Eligible Content
M8.B.2.1.2 Determine the measurement of one interior angle of a regular polygon (3-8 sided polygons, formula provided on the reference sheet).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.2.1.3 Determine the number of sides of a polygon given the total number of degrees in the interior angles (3-8 sided polygons, formula provided on the reference sheet).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.2.2.1 Calculate the surface area of cubes and rectangular prisms (formula provided on the reference sheet).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.B.2.2.2 Calculate the volume of cubes and rectangular prisms (formulas provided on the reference sheet).	**M08.C-G.3.1.1** Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. Formulas will be provided.	PACCS addresses application to value problems
M8.B.2.2.3 Determine the appropriate type of measurement (circumference, perimeter, area, surface area, volume) for a given situation (e.g., which measurement is needed to determine the amount of carpeting for a room).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.C Geometry	**M08.C-G Geometry**	
M8.C.1.1.1 Match the three-dimensional figure with its net (cube, cylinder, cone, prism, pyramid). Any measurements used should be consistent in the stem and answer choices.	**M08.C-G.1.1.1** Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations. **M08.C-G.1.1.2** Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them. **M08.C-G.3.1.1** Apply formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems. Formulas will be provided.	PACCS goes into great detail with geometry related to rotations, reflections and translations, also, students need to know the formulas for volume and be able to use them. PACCS goes into different types of problems using the coordinate plane.
M8.C.1.1.2 Define, identify and/or use properties of angles formed by intersecting lines (complementary, supplementary,	**M08.C-G.1.1.1** Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in	PACCS extends to rotations reflections and translation

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adjacent and/or vertical angles).	rotations, reflections, and translations.	
M8.C.1.1.3 Define, identify and/or use properties of angles formed when two parallel lines are cut by a transversal (alternate interior, alternate exterior, vertical corresponding).	**M08.C-G.1.1.1** Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations.	PACCS extends to rotations reflections and translation
M8.C.1.2.1 Use the Pythagorean Theorem to find the measure of a missing side of a right triangle (formula provided on the reference sheet – whole numbers only).	**M08.C-G.2.1.1** Apply the converse of the Pythagorean theorem to show a triangle is a right triangle. **M08.C-G.2.1.2** Apply the Pythagorean theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. (Figures provided for problems in three dimensions will be consistent with Eligible Content in grade 8 and below). **M08.C-G.2.1.3** Apply the Pythagorean theorem to find the distance between two points in a coordinate system.	PACCS mentions the proof of the Pythagorean Theorem and applying the Pythagorean Theorem to finding the distance between two points on the coordinate plane
M8.C.3.1.1 Plot, locate or identify ordered pairs on a coordinate plane (the point may be a vertex of a polygon).	**M08.C-G.1.1.1** Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations.	PACCS extends to rotations reflections and translation
Intentionally Blank	**M08.C-G.1.1.3** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures, using coordinates.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed
Intentionally Blank	**M08.C-G.1.1.4** Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
M8.D Algebraic Concepts	**M08.B-E Expressions and Equations** **M08.B-F Functions**	

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M8.D.1.1.1 Continue a numeric or algebraic pattern (pattern must show 3 repetitions – may include up to 2 operations, squares and square roots).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.D.1.1.2 Find missing elements in numeric or geometric patterns and/or functions (may be given a table or rule – pattern must show 3 repetitions).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.D.1.1.3 Determine the rule of a function (given elements in an input-output table, chart or list – limit to linear functions).	**M08.B-F.1.1.1** Determine whether a relation is a function.	PACCS determination functions
	M08.B-F.1.1.2 Compare properties of two functions each represented in a different way (i.e., algebraically, graphically, numerically in tables, or by verbal descriptions). Example: Given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.	Not specifically addressed in PA Academic Standard Eligible Content.
M8.D.2.1.1 Solve one- or two-step equations and inequalities (should not include absolute values – one variable only).	**M08.B-E.3.1.**1 Write and identify 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). **M08.B-E.3.1.2** Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. **M08.B-F.1.1.3** 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.	PACCS asks for examples of linear equations with one, infinite or no solutions rational coefficients in equations are used. Linear functions are specifically mentioned
M8.D.2.1.2 Use substitution to check the accuracy of a given value for an equation or inequality (simple inequalities with one variable).	**M08.B-F.2.1.1** 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	PACCs talks about functions only in more detail than PA

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	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.	
M8.D.2.1.3 Determine the value of an algebraic expression by simplifying and/or substituting a number for the variable.	**M08.B-F.2.1.1** 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.	PACCS talks about functions only in more detail than PA Academic
M8.D.2.2.1 Match a written situation to its numeric and/or algebraic expression, equation or inequality (up to two variables in equations or expressions – one variable with inequalities).	**M08.B-F.2.1.2** 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 or determine a graph that exhibits the qualitative features of a function that has been described verbally.	PACCS analyzes graphs
M8.D.2.2.2 Write and/or solve an equation for a given problem situation (one variable only).	**M08.B-E.3.1.2** Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms. **M08.B-F.2.1.2** 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 or determine a graph that exhibits the qualitative features of a function that has been described verbally.	PACCS extends to more complicated linear equations and graphical analysis
M8.D.4.1.1 Graph a linear function based on an x/y table (integers only).	**M08.B-E.3.1.1** Write and identify 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	PACCS asks for examples of linear equations with one, infinite or no solutions, rational coefficients in equations are used. Linear functions are specifically mentioned

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	equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	
M8.D.4.1.2 Match the graph of a linear function to its x/y table (integers only).	**M08.B-E.3.1.1** Write and identify 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).	PACCS asks for examples of linear equations with one, infinite or no solutions, rational coefficients in equations are used. Linear functions are specifically mentioned
M8.D.4.1.3 Match the linear equation (y = mx + b form) to the x/y table (integers only in the table).	**M08.B-E.2.1.3** 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. **M08.B-E.3.1.2** Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	PACCS moves beyond matching
Intentionally Blank	**M08.B-E.3.1.3** Interpret solutions to a system of two linear equations in two variables as points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
Intentionally Blank	**M08.B-E.3.1.4** Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. Example: 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
Intentionally Blank	**M08.B-E.3.1.5** Solve real-world and mathematical problems leading to two linear equations in two variables. Example: Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly

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	through the second pair.	addressed.
M8.E Data Analysis and Probability	**M08.D-S Statistics and Probability**	
M8.E.1.1.1 Choose and/or explain the correct representation (graph) for a set of data.	**M08.D-S.1.1.1** 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 correlation, linear association, and nonlinear association.	PACCS works to construct and interpret
M8.E.1.1.2 Analyze data and/or answer questions pertaining to data shown in multiple line graphs, circle graphs or histograms.	**M08.D-S.1.1.1** 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 correlation, linear association, and nonlinear association. **M08.D-S.1.1.2** For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.	PACCS goes into a great detail about scatter plots only
M8.E.1.1.3 Interpret data shown in stem-and-leaf or box-and-whisker plots.	**M08.D-S.1.1.1** 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 correlation, linear association, and nonlinear association.	PACCS goes into a great detail about scatter plots only
M8.E.3.1.1 Find the probability for a mutually exclusive or an independent event (written as a fraction in simplest form).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.E.3.2.1 Determine/show the number of permutations and/or combinations for an event using up to four choices (e.g., organized list, etc.).	Intentionally Blank	Not specifically addressed in PACCS Eligible Content
M8.E.4.1.1 Fit a line to a scatter plot and/or describes any correlation between the two variables (positive, negative, strong, weak or none).	**M08.D-S.1.1.1** 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	PACCS goes into a great detail about scatter plots only

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	correlation, linear association, and nonlinear association.	
M8.E.4.1.2 Make predictions based on survey results or graphs (bar, line, circle, scatterplots, etc.).	**M08.D-S.1.1.2** For scatter plots that suggest a linear association, identify a line of best fit by judging the closeness of the data points to the line.	PACCS goes into a great detail about scatter plots only
Intentionally Blank	**M08.D-S.1.1.3** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. Example: In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr. as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.
Intentionally Blank	**M08.D-S.1.2.1** 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 associations between the two variables. Example: Given data on whether students have a curfew on school nights and whether they have assigned chores at home, is there evidence that those who have a curfew also tend to have chores?	Not specifically addressed in PA Academic Standard Eligible Content. In transitioning to PACCS, these specific statements will be assessed and should be explicitly addressed.