

A hand is shown writing on a chalkboard. The board is covered with various mathematical expressions, including MV^2 , $\frac{1}{2}mv^2$, and $(mv^2 + v)$. The text is overlaid on this background.

*Pennsylvania Alternate System of Assessment
(PASA)*

Alternate Assessment Anchors
and Alternate Eligible Content
MATHEMATICS

Grade 11

The Layout of the PSSA Assessment Anchors and PASA Assessment Anchors Alignment Document

Math

PSSA Numbering system

Example: M3.A.1.1

M = Math
 3 = Grade
 A = Reporting category (e.g., Numbers & Operations, Measurement, Geometry, Algebraic Concepts, Data Analysis & Probability)
 1 = Assessment anchor
 1 = Sub assessment anchor

PASA Numbering system

Example: M3&4.AA.1.1a (LC)

M = Math
 3&4 = Grade
 1st A = Reporting category
 2nd A = Alternate assessment
 1 = Assessment anchor
 1 = Sub assessment anchor
 a = Eligible content
 LC = Level

PSSA Assessment Anchor

PASA Assessment Anchor

M3.A Numbers and Operations M4.A			
M3.A.1 M4.A.1	Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	M3&4.AA.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	
PSSA ASSESSMENT ANCHOR		PASA ASSESSMENT ANCHOR	PASA ELIGIBLE CONTENT
GRADE 3			
M3.A.1.1 Apply place-value concepts and numeration to counting, ordering, grouping, and equivalency. M3.A.1.2 Use fractions to represent quantities as part of a whole or part of a set.	M4.A.1.1 Use models and/or words to represent quantities as decimals, fractions, or mixed numbers.	M3&4.AA.1.1 Apply numeracy concepts and use models and fractions to represent quantities as part of a whole or part of a set.	M3&4.AA.1.1 (LA) Matches 2 sets of items with 1 item each – difference between target and closest choice is 12 units – sets are cut to size M3&4.AA.1.1 (LB) Matches numeral to quantity ≤ 5 – the target and 1 set are within +/- 5 M3&4.AA.1.1a (LC) Matches numeral to quantity ≤ 9 – the target and 2 sets are within +/- 5 M3&4.AA.1.1b (LC) Selects item divided evenly...

PSSA Sub Assessment Anchor

PASA Sub Assessment Anchor

PASA Eligible Content

The layout of this document reflects the organization of the PSSA assessment anchor content standards - see 2007 PSSA Technical Report for Reading and Mathematics: Grades 3-8 and 11 (page A-2) (attached on the next page).

**PASA ASSESSMENT ANCHORS AND ELIGIBLE CONTENT
MATH
GRADE 11**

M11.A Numbers and Operations		
PSSA ASSESSMENT ANCHOR	PASA ASSESSMENT ANCHOR	PASA ELIGIBLE CONTENT
M11.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	M11.AA.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.	
M11.A.1.1 Represent and/or use numbers in equivalent forms (e.g., integers, fractions, decimals, percents, square roots, exponents, and scientific notation).	M11.AA.1.1 Demonstrate equivalencies (match and read numbers, sets, fractions).	M11.AA.1.1a (LA) Matches identical numbers M11.AA.1.1b (LA) Matches 2 sets of items with 1-5 items each
		M11.AA.1.1 (LB) Selects item divided evenly and in the number of pieces specified M11.AA.1.1a (LC) Selects item divided evenly and in the number of pieces specified M11.AA.1.1b (LC) Matches fraction shown to picture M11.AA.1.1c (LC) Reads mixed fractions M11.AA.1.1d (LC) Matches quantity to fraction M11.AA.1.1e (LC) Selects sum of 2 fixed figures M11.AA.1.1f (LC) Divides a group of items into fractional groups
M11.A.1.2 Apply number theory concepts to show relationships between real numbers in problem solving settings.	M11.AA.1.2 Compare quantities and numbers, including <ul style="list-style-type: none"> • scan materials, • compare quantities, • count, • identify and count money, and • identify fraction. 	M11.AA.1.2a (LA) Scans materials M11.AA.1.2b (LA) Selects set with 1 M11.AA.1.2c (LA) Selects set with most/least M11.AA.1.2d (LA) Selects one- or five- dollar bill M11.AA.1.2e (LA) Selects part or whole item
		M11.AA.1.2a (LB) Counts aloud items, dollars, or pennies starting at 10 or more without a bridge M11.AA.1.2b (LB) Counts aloud by 5s in an ordered array M11.AA.1.2c (LB) Counts out items or dollar bills from a larger set M11.AA.1.2f (LB) Names the value of a coin M11.AA.1.2g (LB) Orders 3 nonconsecutive

		numbers
		<p>M11.AA.1.2a (LC) Counts aloud items or money (bills or coins) by using a combination of 1s, 2s, 5s, 10s, or 20s</p> <p>M11.AA.1.2b (LC) Counts out a combination of one-, five-, ten-, and/or twenty-dollar bills</p> <p>M11.AA.1.2c (LC) Counts out various denominations of money to purchase item</p> <p>M11.AA.1.2d (LC) Selects item that can be purchased for the price named</p> <p>M11.AA.1.2e (LC) Orders 4 nonconsecutive numbers</p>
M11.A.1.3 Estimate the value of an irrational number.		
M11.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.		
M11.A.2.1 Apply ratio and/or proportions in problem-solving situations.		
M11.A.2.2 Use exponents, roots, and/or absolute value to solve problems.		

M11.A.3	Compute accurately and fluently and make reasonable estimates.	M11.AA.3 Compute accurately and fluently and make reasonable estimates.	
M11.A.3.1 Apply the order of operations in computation and in problem-solving situations.	M11.AA.3.1 Computes accurately to solve problems (add, subtract, multiply, and divide).	<p>M11.AA.3.1a (LB) Adds 2 numbers or prices</p> <p>M11.AA.3.1b (LB) Adds 3 numbers</p> <p>M11.AA.3.1c (LB) Subtracts 2 numbers or prices</p> <p>M11.AA.3.1d (LB) Multiplies numbers by 2s or 5s with items by skip counting</p>	<p>M11.AA.3.1a (LC) Adds 2 numbers or prices in a word problem</p> <p>M11.AA.3.1b (LC) Adds 3 numbers in a word</p>

		<p>problem</p> <p>M11.AA.3.1c (LC) Selects equation required to solve an addition word problem with sums</p> <p>M11.AA.3.1d (LC) Subtracts 2 numbers or prices in a word problem</p> <p>M11.AA.3.1e (LC) Selects equation required to solve a subtraction word problem</p> <p>M11.AA.3.1f (LC) Multiplies numbers in a word problem</p> <p>M11.AA.3.1g (LC) Divides 2 numbers</p>
M11.A.3.2 Use estimation strategies in problem-solving situations.	M11.AA.3.2 Use estimation strategies in problem-solving situations (match similar quantities).	<p>M11.AA.3.2 (LB) Selects quantity that is enough</p> <p>M11.AA.3.2 (LC) Matches quantity that is enough</p>

M11.B Measurement		
M11.B.1	Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.	
Not assessed.		
M11.B.2	Apply appropriate techniques, tools and formulas to determine measurements.	M11.BA.2 Apply appropriate techniques, tools and formulas to determine measurements.
M11.B.2.1	Use and/or compare measurements of angles.	
M11.B.2.2	Use and/or develop procedures to determine or describe measures of perimeter, circumference, area, surface area, and/or volume. (May require conversions within the same system.)	<p>M11.BA.2.2 Determine measurements, including</p> <ul style="list-style-type: none"> • match, compare, and measure length; • match, compare, and measure area; • match, measure, and compare volume; • match and compare capacity; and, • match, read, and determine time. <p>M11.BA.2.2a (LA) Matches objects, pictures of items, photographs of items of same length</p> <p>M11.BA.2.2b (LA) Selects longest/shortest object, picture of item, photograph of item</p> <p>M11.BA.2.2c (LA) Matches identical shapes of same size, objects, pictures, photographs of same size</p> <p>M11.BA.2.2d (LA) Selects biggest/smallest shape</p> <p>M11.BA.2.2e (LA) Selects biggest/smallest object by area, picture, photograph</p> <p>M11.BA.2.2f (LA) Matches items with same volume</p>

		<p>M11.BA.2.2g (LA) Selects biggest/smallest object by volume M11.BA.2.2h (LA) Matches items with same capacity M11.BA.2.2i (LA) Selects item that holds the most/least M11.BA.2.2j (LA) Matches item to space M11.BA.2.2k (LA) Selects half-filled item M11.BA.2.2l (LA) Matches identical digital times</p> <p>M11.BA.2.2a (LB) Measures length of item M11.BA.2.2b (LB) Measures composite item area by counting units M11.BA.2.2c (LB) Selects largest/smallest area in similar shapes M11.BA.2.2d (LB) Selects 1/4-cup measure M11.BA.2.2e (LB) Locates 1/2-cup or 1/4-cup line on a measuring cup M11.BA.2.2f (LB) Reads analog time M11.BA.2.2g (LB) Matches identical analog and digital times M11.BA.2.2h (LB) Selects activity that takes most/least amount of time</p> <p>M11.BA.2.2a (LC) Measures length of item M11.BA.2.2b (LC) Measures using a measuring cup M11.BA.2.2c (LC) Measures a larger amount using a fraction of a cup M11.BA.2.2d (LC) Matches closest digital and analog times M11.BA.2.2e (LC) Matches digital time to commonly used time phrases M11.BA.2.2f (LC) Determines duration or wait time given 2 times M11.BA.2.2g (LC) Determines time using a word problem with hours and a starting time</p>
<p>M11.B.2.3 Describe how a change in one dimension of a figure (2 or 3 dimensional) affects other measurements of that figure.</p>		

M11.C Geometry		
M11.C.1	Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.	M11.CA.1 Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.
ASSESSMENT ANCHOR	ALTERNATE ANCHOR	ALTERNATE SKILL ASSESSED
<i>M11.C.1.1 Identify and/or use parts of circles and segments associated with circles.</i>		
<i>M11.C.1.2 Recognize and/or apply properties of angles, triangles, and quadrilaterals.</i>		
M11.C.1.3 Use properties of congruence, correspondence and similarity in problem-solving settings involving two- and three-dimensional figures.	M11.CA.1.3 Use basic properties of two- and three-dimensional figures (sort).	M11.CA.1.3 (LA) Sorts 3 objects into each of 3 existing groups
		M11.CA.1.3 (LB) Sorts 9 items into 4 groups
		M11.CA.1.3 (LC) Sorts 9 items into 4 groups
<i>M11.C.1.4 Solve problems involving right triangles using the Pythagorean Theorem.</i>		
M11.C.2	Identify and/or apply concepts of transformations or symmetry.	
<i>Not assessed.</i>		
M11.C.3	Locate points or describe relationships using the coordinate plane.	
<i>M11.C.3.1 Solve problems using analytic geometry.</i>		

M11.D Algebraic Concepts		
M11.D.1	Demonstrate an understanding of patterns, relations and functions.	
	ASSESSMENT ANCHOR	ALTERNATE ANCHOR
		ALTERNATE SKILL ASSESSED
<i>M11.D.1.1</i>	<i>Analyze and/or use patterns or relations.</i>	
M11.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.		
<i>M11.D.2.1</i>	<i>Write, solve, and/or graph linear equations and inequalities using various methods.</i>	
<i>M11.D.2.2</i>	<i>Simplify expressions involving polynomials.</i>	
M11.D.3 Analyze change in various contexts.		
<i>M11.D.3.1</i>	<i>Describe and/or determine change.</i>	
<i>M11.D.3.2</i>	<i>Compute and/or use the slope of a line.</i>	
M11.D.4 Describe or use models to represent quantitative relationships.		
<i>M11.D.4.1</i>	<i>Interpret and/or use linear, quadratic and/or exponential functions and their equations, graphs, or tables.</i>	

M11.E Data Analysis and Probability		
M11.E.1	Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.	M11.EA.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret, or analyze data.
ASSESSMENT ANCHOR	ALTERNATE ANCHOR	ALTERNATE SKILL ASSESSED
M11.E.1.1 Appropriately display and/or use data in problem-solving settings.	M11.EA.1.1 Interpret data shown, including <ul style="list-style-type: none"> • interpret bar graphs and • interpret tables. 	M11.EA.1.1a (LB) Selects largest/smallest value
		M11.EA.1.1b (LB) Selects largest/smallest value from graph
		M11.EA.1.1c (LB) Locates number described in a 9-10 item display
		M11.EA.1.1 (LC) Locates number described in 11-12 item, 3-variable display, with no teacher assistance in identifying the variables
	M11.EA.1.2 Use measures of central tendency to describe a set of data (select mean and mode).	M11.EA.1.2a (LC) Selects mode on graph
		M11.EA.1.2b (LC) Selects average value on graph
		M11.EA.1.2c (LC) Selects average across 4 values
M11.E.2	Select and/or use appropriate statistical methods to analyze data.	M11.EA.2 Select and/or use appropriate statistical methods to analyze data.
M11.E.2.1	<i>Use measures of central tendency to describe a set of data.</i>	
M11.E.3	Understand and/or apply basic concepts of probability or outcomes.	M11.EA.3 Understand and/or apply basic concepts of probability or outcomes.
M11.E.3.1	Apply probability and/or odds to practical situations.	M11.EA.3.1 Apply probability and/or odds to practical situations (select most/least likely outcome).
M11.E.3.2	<i>Apply counting techniques in problem-solving settings.</i>	M.11.EA.3.1 (LC) Selects most/least likely outcome given the characteristics of a population

<p>M11.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.</p>		
<p><i>M11.E.4.1 Make predictions using data displays and probability.</i></p>		
<p><i>M11.E.4.2 Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions.</i></p>		