

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 3

Comprehensive Data Analysis

M3.A Numbers and Operations	M3.B Measurement	M3.C Geometry	M3.D Algebraic Concepts	M3.E Data Analysis and Probability
<p style="text-align: center;">M3.A.1</p> <ul style="list-style-type: none"> Match the word name with the appropriate whole number (up through 9999). Differentiate and/or give examples of even and odd numbers (limit to 3 digits) Compare two whole numbers using greater than (>), less than (<) or equal to (=) (up through 9,999). Order a set of whole numbers from least to greatest or greatest to least (up through 9999, limit sets to no more than four numbers). Match a symbolic representation of numbers to appropriate whole numbers (e.g., base ten blocks, 7 hundreds, 4 tens and 8 ones, etc). Write the fraction that corresponds to a drawing or part of a set (numerators 1-9, denominators 2-10. No equivalent or improper fractions or mixed numbers). Create a drawing or set that represents a given fraction (numerators 1-9, denominators 2-10. No equivalent or improper fractions or mixed numbers). Count a collection of bills and coins less than \$5.00 (penny, nickel, dime, quarter, dollar). Money may be represented as 15 cents, 15¢ or \$0.15. Compare total values of combinations of coins less than \$5.00 (penny, nickel, dime, quarter, dollar). Make change for an amount up to \$5.00 with no more than \$2.00 change given (penny, nickel, dime, quarter, dollar.. 	<p style="text-align: center;">M3.B.1</p> <ul style="list-style-type: none"> Tell/show time (analog) to the minute. Find elapsed time to increments of 5 minutes (limited to 2 adjacent hours). Identify times of the day and night as AM or PM. Select an appropriate unit for the attribute being measured. Compare and/or order objects according to length, area, or weight. 	<p style="text-align: center;">M3.C.1</p> <ul style="list-style-type: none"> Name/identify/describe geometric shapes in two dimensions (circle, square, rectangle, triangle, pentagon, hexagon, octagon). Name/identify geometric shapes in three dimensions (sphere, cube, cylinder, cone, pyramid, rectangular prism). 	<p style="text-align: center;">M3.D.1</p> <ul style="list-style-type: none"> Extend or find a missing element in a pattern of numbers or shapes (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5) Identify/describe the rule for a pattern shown (pattern must show 3 repetitions – if multiples are used, limit to 2, 3, or 5) 	<p style="text-align: center;">M3.E.1</p> <ul style="list-style-type: none"> Analyze data shown on tables, charts, or bar graphs using the concepts of largest, smallest, most often, least often and middle. Describe, interpret and/or answer questions based on data shown in tables, charts, and bar graphs. Graph data or complete a graph given the data (grid is provided). Translate information from one type of display to another (e.g., convert tally chart to bar graph). Limit to tally charts, bar graphs, and tables.
<p style="text-align: center;">M3.A.2</p> <ul style="list-style-type: none"> Represent multiplication as repeated addition. Demonstrate the inverse relationship between addition and subtraction using fact families. Identify the correct operation(s) to solve a word problem (no more than 2 operations using +, - and/or x). 	<p style="text-align: center;">M3.B.2</p> <ul style="list-style-type: none"> Use a ruler (provided) to measure to the nearest ½ inch. Match the object with its approximate measurement (all measurements given must be of the same system, e.g., about how tall is a soda pop can? 5 inches, 5 feet, 5 yards, etc.). 	<p style="text-align: center;">M3.C.2</p> <ul style="list-style-type: none"> Identify one line of symmetry in a two-dimensional figure. Identify symmetrical two-dimensional shapes. 	<p style="text-align: center;">M3.D.2</p> <ul style="list-style-type: none"> Create or match a story to a given combination of symbols (+, -, x, <, >, =) and numbers Choose the number sentence that matches a given story (one operation, + or – only). Find a missing number that makes a number sentence true (1-digit or 2-digit numbers up to 18 using +, -, or x through 9x5). Identify the missing symbol (+, -, =, <, >) that makes a number sentence true. 	<p style="font-size: 24pt;">13% of PSSA</p>
<p style="text-align: center;">M3.A.3</p> <ul style="list-style-type: none"> Solve single- and double-digit addition and subtraction problems with and without regrouping in vertical or horizontal form. Solve problems involving multiplication through the 9's tables through 9 x 5. Solve triple digit addition and subtraction problems without regrouping in vertical or horizontal form. Estimate sums and differences of quantities; round 2-digit numbers to the nearest 10, and 3 digit numbers to the nearest 100, before computing (limit to two numbers) 	<p style="font-size: 24pt;">16% of PSSA</p>	<p style="font-size: 24pt;">15% of PSSA</p>	<p style="font-size: 24pt;">13% of PSSA</p>	<p style="font-size: 24pt;">13% of PSSA</p>
<p style="font-size: 24pt;">43% of PSSA</p>				<p style="font-size: 10pt;">Format © Jim Stockdale</p>

Percent of Items Tested in Each Reporting Category - 2006 PSSA Mathematics Test
Source: eMetric

Actual Percentage Range ±4% in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 3

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 4

Comprehensive Data Analysis

<u>M4.A</u> Numbers and Operations	<u>M4.B</u> Measurement	<u>M4.C</u> Geometry	<u>M4.D</u> Algebraic Concepts	<u>M4.E</u> Data Analysis and Probability
<p style="text-align: center;"><u>M4.A.1</u></p> <ul style="list-style-type: none"> Write the fraction or decimal, including mixed numbers, which corresponds to a drawing or set – no simplification necessary. Create a drawing or set that represents a given fraction or decimal, including mixed numbers (through the tenths). Match the standard number form to the word form of decimal numbers (through the tenths place). Write whole numbers in expanded, standard and/or word form through 6 digits (example of standard to expanded form: 43,08 - 20096 = 40,000+3000+70+6). Locate/identify fractions or decimals on a number line (decimals and fractions through the tenths – do not mix fractions and decimals). Compare and/or order whole numbers through 6 digits and amounts of money to \$100 (limit sets for ordering, to no more than 4 numbers). List/identify all factors through 10 of any given number. List/identify multiples of a number, where the multiples do not exceed 100. 	<p style="text-align: center;"><u>M4.B.1</u></p> <ul style="list-style-type: none"> Match/construct analog time (a picture of a clock), to the same time written in digital. Identify time (analog or digital) as the amount of minutes before and/or after the hour (e.g., 2:50 is the same as 10 minutes before 3:00; quarter past six is the same as 6:15). Calculate the elapsed time, to the minute, in a given situation (limited to 2 adjacent hours). Determine the beginning or ending time, given the elapsed time (limited to 2 adjacent hours). 	<p style="text-align: center;"><u>M4.C.1</u></p> <ul style="list-style-type: none"> Identify, classify and/or compare two-dimensional figures (circle, triangle, square, parallelogram, trapezoid, rhombus, rectangle, pentagon, hexagon, octagon). Identify or classify three-dimensional figures (cube, sphere, rectangular prism and pyramid). Identify points, lines, line segments or rays. Identify parallel and perpendicular lines. 	<p style="text-align: center;"><u>M4.D.1</u></p> <ul style="list-style-type: none"> Extend or find a missing element in a numerical or geometric pattern (+, - or x may be used – numerical patterns must be whole numbers). Identify/describe the rule for a numerical or geometric pattern shown (+, - or x may be used - numerical patterns must be whole numbers). Create or replicate a numerical or geometric pattern showing 3 repetitions (+, - or x may be used - numerical patterns must be whole numbers or money). Determine the missing elements in a function table (functions may use +, - or x and whole numbers or money). Determine the rule for a function given a table (functions may use +, - or x and whole numbers). 	<p style="text-align: center;"><u>M4.E.1</u></p> <ul style="list-style-type: none"> Describe, interpret and/or answer questions based on data shown in tables, charts, bar graphs or pictographs. Graph data or complete a graph given the data (bar graph or pictograph – grid is provided). Translate information from one type of display to another (table, chart, bar graph, or pictograph).
<p style="text-align: center;"><u>M4.A.2</u></p> <ul style="list-style-type: none"> Solve problems involving all operations with whole numbers, and/or explain the solution (limit to two-step problems; e.g., multiply then add – single digit multipliers and divisors). Solve problems involving addition or subtraction with decimals through the tenths or money to the cent and/or explain the solution. Limit to two-step problems. 	<p style="text-align: center;"><u>M4.B.2</u></p> <ul style="list-style-type: none"> Use or read a ruler (provided) to measure to the nearest 1/4 inch or centimeter. Make reasonable estimates of weights, lengths and capacities of familiar objects (measurements in the same system). 	<p style="text-align: center;"><u>M4.C.2</u></p> <ul style="list-style-type: none"> Identify or create figures that have one, two or no lines of symmetry. 	<p style="text-align: center;"><u>M4.D.2</u></p> <ul style="list-style-type: none"> Correlate story situations with expressions or equations (may use numbers and one operation +, - or x; no variables). Solve for a missing number in an equation (using estimation, guess & check, etc.). May use +, - or single digit x or +. Identify the missing symbol (+, -, x, ÷, =, <, >) that makes a number sentence true (single digit x or + only). 	<p style="text-align: center;"><u>M4.E.3</u></p> <ul style="list-style-type: none"> Make a prediction based on data or chance (data may be shown in tables, charts, line graphs, bar graphs or pictographs).
<p style="text-align: center;"><u>M4.A.3</u></p> <ul style="list-style-type: none"> Round whole numbers to the nearest ten, hundred, thousand, ten-thousand or hundred-thousand. Round amounts of money to the nearest dollar. Estimate the answer to addition, subtraction and multiplication problems using whole numbers through 6 digits (for multiplication, no more than 2 digits X 1 digit, excluding powers of 10). Solve addition or subtraction problems involving decimals through hundredths (decimal numbers must have the same number of places). Solve addition or subtraction problems with fractions with like denominators (denominators to 10, no simplifying necessary). 	<p style="font-size: 1.2em;">14% of PSSA</p>	<p style="font-size: 1.2em;">14% of PSSA</p>	<p style="font-size: 1.2em;">14% of PSSA</p>	<p style="font-size: 1.5em;">14% of PSSA</p>
<p style="font-size: 1.5em;">44% of PSSA</p>				

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Percent of Items Tested in Each Reporting Category - 2006 PSSA Mathematics Test
Source: eMetric

Actual Percentage Range ±4% in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 4

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 5

Comprehensive Data Analysis

<u>M5.A</u> Numbers and Operations	<u>M5.B</u> Measurement	<u>M5.C</u> Geometry	<u>M5.D</u> Algebraic Concepts	<u>M5.E</u> Data Analysis and Probability
<p style="text-align: center;"><u>M5.A.1</u></p> <ul style="list-style-type: none"> • Use expanded notation to represent whole numbers or decimals (whole numbers less than 10,000,000 and decimals through hundredths). • Match the standard form to the word form of decimal numbers through the hundredths. • Identify the place value of a digit (from millions through hundredths). • Compare whole numbers through 9 digits using the words more, less, equal, least, most, greater than, less than or the symbols <, >, =. • Compare and/or order decimals through the hundredths. (Limit sets for ordering to no more than 4 numbers.) • Compare proper fractions through 16ths with like and unlike denominators. • Locate/identify integers on a number line (greater than or equal to -20). • Identify negative temperatures on a thermometer (through -20°C or °F). • Use or develop regions and/or sets (e.g., circle graph, base ten blocks) to model fractions and mixed numbers through hundredths (may include reducing the fractions). • Define/list/identify prime and composite numbers less than or equal to 100. • Define/list/identify factors and/or multiples of a given whole number less than or equal to 50. 	<p style="text-align: center;"><u>M5.B.1</u></p> <ul style="list-style-type: none"> • Select the appropriate unit for measuring weight (mass), capacity, length, perimeter and area. • Convert using linear measurements, capacity, and weight (mass) within the same system to the unit immediately above or below the given unit (using only the units below – use a conversion chart or a “hint” with problems e.g., hint: 16oz = 1lb). <ul style="list-style-type: none"> ➢ Metric using mm, cm, m and km; mL and L; g and kg ➢ Customary using cup, pint, quart, gallon; in, ft, yd; oz, lb. • Add or subtract linear measurements, (feet and inches) or units of time (hours and minutes), without having to regroup with subtraction (answer should be in simplest form). • Estimate which polygon (shown on a grid) has a greater perimeter or area (compare either area to area or perimeter to perimeter). • Estimate the area of an irregular figure shown on a grid. 	<p style="text-align: center;"><u>M5.C.1</u></p> <ul style="list-style-type: none"> • Identify, and/or classify cubes, rectangular prisms or pyramids using faces, vertices and edges. • Identify and/or describe properties of all types of quadrilaterals (parallelogram, rectangle, rhombus, square, trapezoid). • Identify, draw and/or label points, lines, line segments and rays. 	<p style="text-align: center;"><u>M5.D.1</u></p> <ul style="list-style-type: none"> • Extend or find a missing element in a numerical or simple geometric pattern (+, -, x or ÷ of whole numbers). Pattern must show 3 repetitions. • Create or replicate a numerical or geometric pattern showing 3 repetitions of that pattern (+, -, x or ÷ of whole numbers may be used). • Form a rule based on a given pattern, or illustrate a pattern based on a given rule (+, -, x or ÷ of whole numbers may be used). Patterns must show 3 repetitions. 	<p style="text-align: center;"><u>M5.E.1</u></p> <ul style="list-style-type: none"> • Display and/or interpret data shown in tallies, tables, charts, pictographs, bar graphs, line graphs and using a title, appropriate scale, and labels. • A grid will be provided to display data on bar graphs or line graphs.
		<p style="text-align: center;"><u>M5.C.2</u></p> <ul style="list-style-type: none"> • Draw or identify a translation (slide), reflection (flip) or rotation (turn) of a 2-dimensional shape. • Identify the number of lines of symmetry and/or draw all lines of symmetry in a two-dimensional polygon. 	<p style="text-align: center;"><u>M5.D.2</u></p> <ul style="list-style-type: none"> • Solve for a missing number (blank, question mark, variable) in an equation involving a single operation whole numbers only. • Match a realistic situation to an equation, expression, inequality (<, >, =), table or graph (variable must be isolated, e.g., 17 + 39 = n). 	<p style="text-align: center;"><u>M5.E.2</u></p> <ul style="list-style-type: none"> • Determine the mean/average (answer is a whole number), median (answer is a whole number or average of 2 numbers) and range of data (up to 10 numbers). • Identify the mode in a set of data (up to 10 numbers).
	<p style="text-align: center;"><u>M4.B.2</u></p> <ul style="list-style-type: none"> • Use a ruler to measure to the nearest 1/8 inch or centimeter. • Find the perimeter of a figure drawn and labeled (with the same units throughout). • Find the area of a square or rectangle (with the same units throughout - whole numbers only). • Solve problems involving weight, time, temperature, length and capacity (with the same units throughout - limited to 3 digits). 	14% of PSSA		<p style="text-align: center;"><u>M4.E.3</u></p> <ul style="list-style-type: none"> • Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (information could be represented by pictographs, bar graphs, charts, tables and/or spinners). • Determine the probability of an outcome (e.g., a coin toss, a roll of a number cube) and express as a fraction without reduction.
<p style="text-align: center;"><u>M5.A.2</u></p> <ul style="list-style-type: none"> • Solve problems involving addition, subtraction, multiplication and division of whole numbers (multipliers up to 2 digits – divisors one digit) and decimals including money (answer through hundredths – no division with decimals). • Solve problems involving addition and subtraction of fractions (through 16ths – like and unlike denominators – for unlike denominators, the LCD must be one of the given denominators). • Choose the correct operation(s) to solve a problem (no more than 2 operations). 			<p style="text-align: center;">15% of PSSA</p>	<p style="text-align: center;">14% of PSSA</p>
<p style="text-align: center;"><u>M5.A.3</u></p> <ul style="list-style-type: none"> • Round whole numbers through millions and decimals through hundredths. • Use estimation to solve problems involving whole numbers and/or decimals (up to 2-digit multipliers, single-digit divisors or multiples of 10; whole numbers through thousands and decimals through hundredths). • Use addition, subtraction, multiplication and division to compute accurately without a calculator (multipliers up to 2 digits, single-digit divisors or multiples of 10 – whole numbers through thousands and decimals through hundredths - no division with decimals). 	<p style="text-align: center;">14% of PSSA</p>			
43% of PSSA				

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Percent of Items Tested in Each Reporting Category - 2006 PSSA Mathematics Test
Source: eMetric

Actual Percentage Range ±4% in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 5

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 6

Comprehensive Data Analysis

M6.A Numbers and Operations	M6.B Measurement	M6.C Geometry	M6.D Algebraic Concepts	M6.E Data Analysis and Probability	
<p style="text-align: center;">M6.A.1</p> <ul style="list-style-type: none"> • Represent common percents as fractions and/or decimals (e.g., 25% = $\frac{1}{4}$ = .25) – common percents are 1%, 10%, 25%, 50%, 75%, 100%. • Convert between fractions and decimals and/or differentiate between a terminating decimal and a repeating decimal. • Represent a number in exponential form (e.g., $10 \times 10 \times 10 = 10^3$). • Represent a mixed number as an improper fraction. • Compare and/or order whole numbers, mixed numbers, fractions and/or decimals (do not mix fractions and decimals – decimals through thousandths). • Find the Greatest Common Factor (GCF) of two numbers (through 50) and/or use the GCF to simplify fractions. • Find the Least Common Multiple (LCM) of two numbers (through 50) and/or use the LCM to find the common denominator of two fractions. • Use divisibility rules for 2, 3, 5 and/or 10 to draw conclusions and/or solve problems. • Model percents (through 100%) using drawings, graphs, and/or sets (e.g. circle graph, base ten blocks, etc.) 	<p style="text-align: center;">M6.B.1</p> <ul style="list-style-type: none"> • Determine and/or compare elapsed time to the minute (time may cross AM to PM or more than one day). 	<p style="text-align: center;">M6.C.1</p> <ul style="list-style-type: none"> • Identify, classify and/or compare polygons (up to ten sides.) • Identify and/or describe properties of all types of triangles (scalene, equilateral, isosceles, right, acute, obtuse). • Identify and/or determine the measure of the diameter and/or radius of a circle (when one or the other is given). • Identify and/or use the total number of degrees in a triangle, quadrilateral and/or circle. • Identify, describe and/or label parallel, perpendicular or intersecting lines. • Identify, draw and/or label points, planes, lines, line segments, rays, angles and vertices. 	<p style="text-align: center;">M6.D.1</p> <ul style="list-style-type: none"> • Create, extend or find a missing element in a pattern displayed in a table, chart or graph (pattern must show at least 3 repetitions - may use up to 2 operations with whole numbers). • Determine a rule based on a pattern or illustrate a pattern based on a given rule (displayed on a table, chart or graph; pattern must show at least 3 repetitions). 	<p style="text-align: center;">M6.E.1</p> <ul style="list-style-type: none"> • Analyze data and/or answer questions pertaining to data represented in frequency tables, circle graphs, double bar graphs, double line graphs or line plots (for circle graphs, no computation with percents). • Choose the appropriate representation for a specific set of data (choices should be the same type of graph). • Display data in frequency tables, circle graphs, double-bar graphs, double line graphs or line plots using a title, appropriate scale, labels and a key when needed. <ul style="list-style-type: none"> ➢ Circle graphs for open-ended items must show a center point and tic marks. 	
<p style="text-align: center;">M6.A.2</p> <ul style="list-style-type: none"> • Complete equations by using the following properties: associative, commutative, distributive and identity. 	16% of PSSA	<p style="text-align: center;">M6.C.3</p> <ul style="list-style-type: none"> • Plot, locate or identify points in Quadrant I and/or on the x and y axes with intervals of 1, 2, 5 or 10 units - up to a 200 by 200 grid. Points may be in-between lines. 	<p style="text-align: center;">M6.D.2</p> <ul style="list-style-type: none"> • Identify the inverse operation needed to solve a one-step equation. • Solve a one-step equation (i.e., using the inverse operation -whole numbers only). • Match an equation or expression involving one variable, to a verbal math situation (one operation only). 	<p style="text-align: center;">M6.E.2</p> <ul style="list-style-type: none"> • Determine/calculate the mean, median, mode and/or range of displayed data (data can be displayed in a table or line plot – use whole numbers only up to 2 digits). 	
<p style="text-align: center;">M6.A.3</p> <ul style="list-style-type: none"> • Use estimation to solve problems involving whole numbers and decimals (up to 2-digit divisors and 4 operations). • Solve problems involving operations (+, -, x, ÷) with whole numbers, decimals (through thousandths) and fractions (avoid complicated LCDs) - straight computation or word problems. 		18% of PSSA	18% of PSSA	18% of PSSA	<p style="text-align: center;">M6.E.3</p> <ul style="list-style-type: none"> • Define and/or find the probability of a simple event (express as a fraction in lowest terms). • Determine/show all possible combinations involving no more than 20 total arrangements (e.g., tree diagram, table, or grid).
30% of PSSA		18% of PSSA			18% of PSSA

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Percent of Items Tested in Each Reporting Category - 2006 PSSA Mathematics Test
Source: eMetric

Actual Percentage Range ±4% in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 6

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 7

Comprehensive Data Analysis

<u>M7.A</u> Numbers and Operations	<u>M7.B</u> Measurement	<u>M7.C</u> Geometry	<u>M7.D</u> Algebraic Concepts	<u>M7.E</u> Data Analysis and Probability
<p style="text-align: center;"><u>M7.A.1</u></p> <ul style="list-style-type: none"> • Convert between fractions, decimals and/or percents (e.g., 20% = 0.2 = 1/5) (terminating decimals only). • Compare and/or order whole numbers, mixed numbers, fractions and decimals (fractions and decimals may be mixed – no more than 5 numbers in a set to be ordered). • Compare and/or order integers (no more than five numbers in a set to be ordered), • Locate/identify decimals, fractions, mixed numbers and/or integers on a number line (a mix of these number forms may be on the same number line). 	<p style="text-align: center;"><u>M7.B.1</u></p> <ul style="list-style-type: none"> • Add, subtract, or convert measurements, using only the units below, with and without regrouping (e.g., 4ft – 2ft 5in = 1ft 7in). Answer should be converted to the largest whole unit (e.g., 37oz = 2 Lb 5oz or 39 in = 1 yd 3 in. Conversion chart provided on the reference sheet. ➢ in, ft, yd ➢ fl oz, cup, pint, quart, gallon ➢ oz, lb ➢ sec, min, hours, days ➢ metric units including milli, centi and kilo (m, g or L). 	<p style="text-align: center;"><u>M7.C.1</u></p> <ul style="list-style-type: none"> • Identify, describe and/or define diameter, radius, chord and/or circumference in circles. • Solve problems involving the relationship between the radius and diameter of the same circle. • Identify parallel, perpendicular and/or skew line segments within three-dimensional figures. • Identify and/or use polygons that are similar and/or congruent, given either measurements or tic and angle marks. • Identify corresponding sides and/or angles of congruent or similar polygons. 	<p style="text-align: center;"><u>M7.D.1</u></p> <ul style="list-style-type: none"> • Describe, extend or find a missing element of a pattern (show 3 repetitions of the pattern) • fractions or decimals - may use only one operation from +, - or x • whole numbers – may use only one operation from +, -, x, + or squares 	<p style="text-align: center;"><u>M7.E.1</u></p> <ul style="list-style-type: none"> • Analyze data and/or answer questions pertaining to data represented in histograms, double bar graphs, multiple line graphs or stem-and-leaf plots.
<p style="text-align: center;"><u>M7.A.2</u></p> <ul style="list-style-type: none"> • Use the order of operations to simplify numerical expressions (may use parentheses, brackets, +, -, x, ÷, squares up to 10² and cubes up to 4³; whole numbers only). • Write ratios to compare quantities (e.g. ratio of boys to girls). • Solve for a variable in a given proportion. • Use proportions to determine if two quantities are equivalent (e.g., similar figures, prices of different sized items, etc). • Calculate and/or apply unit rates or unit prices (terminating decimals through the hundredth place only). • Select and/or use ratios or proportions to solve problems. • Use proportions to find the missing length of a side in similar figures. 	<p style="text-align: center;"><u>M7.B.2</u></p> <ul style="list-style-type: none"> • Develop and/or use strategies to find the perimeter and/or area of compound figures (compound figures should only include quadrilaterals and triangles). Area formulas provided on the reference sheet. • Find the circumference and/or area of circles (formulas provided on the reference sheet). • Find the area of triangles and/or all types of parallelograms (formulas provided on the reference sheet). • Interpret and/or apply scales shown on maps, blueprints, models, etc. • Determine and/or apply an appropriate scale for reduction or enlargement. 	<p style="text-align: center;"><u>M7.C.3</u></p> <ul style="list-style-type: none"> • Plot and/or identify ordered pairs on a coordinate plane (all four quadrants). • Identify Quadrants I, II, III, IV, the x- & y-axes and the origin on a coordinate plane. 	<p style="text-align: center;"><u>M7.D.2</u></p> <ul style="list-style-type: none"> • Select and/or use appropriate strategies to solve one-step equations (no negative numbers). • Use substitution of one and/or two variables to simplify expressions (whole numbers only – use order of operations). • Identify expressions, equations or inequalities that model mathematical situations (using whole numbers or decimals, no more than two operations and one variable). 	<p style="text-align: center;"><u>M7.E.2</u></p> <ul style="list-style-type: none"> • Identify/calculate the mean (average), median, mode or range of a set of data. • Decide/choose which measure of central tendency (mean, median, mode or range) would be most appropriate for a given situation.
<p style="text-align: center;"><u>M7.A.3</u></p> <ul style="list-style-type: none"> • Estimate answers to problems involving whole numbers, decimals, fractions or mixed numbers. • Solve problems involving operations (+, -, x, ÷) of whole numbers, decimals, fractions, or mixed numbers (straight computation or word problems) • Solve problems involving addition and subtraction of integers. 	<p>16% of PSSA</p>	<p>18% of PSSA</p>	<p>18% of PSSA</p>	<p>18% of PSSA</p>
<p>30% of PSSA</p>				

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Actual Percentage Range ±4% in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 7

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 8

Comprehensive Data Analysis

<u>M8.A</u> Numbers and Operations	<u>M8.B</u> Measurement	<u>M8.C</u> Geometry	<u>M8.D</u> Algebraic Concepts	<u>M8.E</u> Data Analysis and Probability
<p style="text-align: center;"><u>M8.A.1</u></p> <ul style="list-style-type: none"> Represent numbers using scientific notation and/or exponential forms. Find the square or cube of a whole number (single digit) and/or the square root of a perfect square (without a calculator). 	<p style="text-align: center;"><u>M8.B.1</u></p> <ul style="list-style-type: none"> Convert among metric measurements (milli, centi, kilo using meter, liter and gram) (table of equivalency provided on the reference sheet). 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). Convert time up to 2 units above or below given unit (e.g., seconds to hours). Convert from Fahrenheit to Celsius or Celsius to Fahrenheit (formulas provided on the reference sheet). 	<p style="text-align: center;"><u>M8.C.1</u></p> <ul style="list-style-type: none"> Match the three-dimensional figure with its net (cube, cylinder, cone, prism, or pyramid). Any measurements used should be consistent in the stem and answer choices. Define, identify and/or use properties of angles formed by intersecting lines (complementary, supplementary, adjacent and/or vertical angles). Define, identify and/or use properties of angles formed when two parallel lines are cut by a transversal (alternate interior, alternate exterior, vertical corresponding). 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). 	<p style="text-align: center;"><u>M8.D.1</u></p> <ul style="list-style-type: none"> Continue a numeric or algebraic pattern (pattern must show 3 repetitions – may include up to 2 operations, squares and square roots). Find missing elements in numeric or geometric patterns and/or functions (may be given a table or rule – pattern must show 3 repetitions). Determine the rule of a function (given elements in an input-output table, chart or list – limit to linear functions). 	<p style="text-align: center;"><u>M8.E.1</u></p> <ul style="list-style-type: none"> Choose and/or explain the correct representation (graph) for a set of data. Analyze data and/or answer questions pertaining to data shown in multiple line graphs, circle graphs or histograms. Interpret data shown in stem-and-leaf or box-and-whisker plots.
<p style="text-align: center;"><u>M8.A.2</u></p> <ul style="list-style-type: none"> Simplify numeric expressions involving integers, using the order of operations. (May include all types of grouping symbols. No combining negatives with exponents or compound exponents.) Solve problems involving percents (e.g., tax, discounts, etc) Do not include percent increase or decrease. Represent or solve rate problems (e.g., unit rates, simple interest, distance, etc.) Students may be asked to solve for any term (formulas provided on the reference sheet for distance and interest). Identify, use and/or explain when it is appropriate to round up or round down. Identify, apply and/or explain when an exact answer is needed or when estimation is appropriate. Estimate answers to problems 	<p style="text-align: center;"><u>M8.B.2</u></p> <ul style="list-style-type: none"> Determine the total number of degrees in the interior angles of a polygon in 3 - 8 sided figures (formula provided on the reference sheet). Determine the measurement of one interior angle of a regular polygon (3-8 sided polygons, formula provided on the reference sheet). 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). Calculate the surface area of cubes and rectangular prisms (formula provided on the reference sheet). Calculate the volume of cubes and rectangular prisms (formulas provided on the reference sheet). 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). 	<p style="text-align: center;"><u>M8.C.3</u></p> <ul style="list-style-type: none"> Plot, locate or identify ordered pairs on a coordinate plane (the point may be a vertex of a polygon). 	<p style="text-align: center;"><u>M8.D.2</u></p> <ul style="list-style-type: none"> Solve one- or two-step equations and inequalities (should not include absolute values – one variable only). Use substitution to check the accuracy of a given value for an equation or inequality (simple inequalities with one variable). Determine the value of an algebraic expression by simplifying and/or substituting a number for the variable 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). Write and/or solve an equation for a given problem situation (one variable only). 	<p style="text-align: center;"><u>M8.E.3</u></p> <ul style="list-style-type: none"> Determine/show the number of permutations and/or combinations for an event using up to four choices (e.g., organized list, etc.).
		<p style="text-align: center;"><u>M8.D.4</u></p> <ul style="list-style-type: none"> Graph a linear function based on an x/y table (integers only). Match the graph of a linear function to its x/y table (integers only). Match the linear equation ($y = mx + b$ form) to the x/y table (integers only in the table). 	<p style="text-align: center;"><u>M8.E.4</u></p> <ul style="list-style-type: none"> Fit a line to a scatter plot and/or describe any correlation between the two variables (positive, negative, strong, weak or none). Make predictions based on survey results or graphs (bar, line, circle, scatter plots, etc.). 	
		<p style="text-align: center;"><u>M8.A.3</u></p> <ul style="list-style-type: none"> Simplify numeric expressions involving percents (percents will be limited to: 1%, 10%, 15%, 20%, 25%, 50% or 75%). Add, subtract, multiply and/or divide integers, fractions and/or decimals with and without a calculator (straight computation or word problems.) 	<p style="text-align: center;">16% of PSSA</p>	<p style="text-align: center;">18% of PSSA</p>
<p style="text-align: center;">19% of PSSA</p>			<p style="text-align: center;">29% of PSSA</p>	

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Percent of Items Tested in Each Reporting Category - 2006 PSSA Mathematics Test
Source: eMetric

Actual Percentage Range $\pm 4\%$ in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 8

Pennsylvania Department of Education Eligible Content (2008 - 2009)

MATH – GRADE 11

Comprehensive Data Analysis

M11.A Numbers and Operations	M11.B Measurement	M11.C Geometry	M11.D Algebraic Concepts	M11.E Data Analysis and Probability
<p style="text-align: center;">M11.A.1</p> <ul style="list-style-type: none"> • Find the square root of an integer to the nearest tenth using either a calculator or estimation. • Express numbers and/or simplify expressions using scientific notation (including numbers less than 1). • Simplify square roots. (e.g., $\sqrt{24} = 2\sqrt{6}$) • Find the Greatest Common Factor (GCF) and/or the Least Common Multiple (LCM) for sets of monomials. • Locate/identify irrational numbers at the approximate location on a number line. • Compare and/or order any real numbers (rational and irrational may be mixed). 	<p style="text-align: center;">M11.B.1</p> <ul style="list-style-type: none"> • Measure and/or compare angles in degrees (up to 360°) (protractor must be provided or drawn). • Calculate the surface area of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet. • Calculate the volume of prisms, cylinders, cones, pyramids and/or spheres. Formulas are provided on the reference sheet. • Estimate area, perimeter or circumference of an irregular figure. • Find the measurement of a missing length given the perimeter, circumference, area or volume. • Describe how a change in the linear dimension of a figure affects its perimeter, circumference, area or volume. 	<p style="text-align: center;">M11.C.1</p> <ul style="list-style-type: none"> • Identify and/or use the properties of a radius, diameter and/or tangent of a circle (given numbers should be whole.) • Identify and/or use the properties of arcs, semicircles, inscribed angles and/or central angles. • Identify and/or use properties of triangles (e.g., medians, altitudes, angle bisectors, side/angle relationships, Triangle Inequality Theorem). • Identify and/or use properties of quadrilaterals (e.g., parallel sides, diagonals, bisectors, congruent sides/angles and supplementary angles). • Identify and/or use properties of isosceles and equilateral triangles • Identify and/or use properties of congruent and similar polygons or solids. • Find the measure of a side of a right triangle using the Pythagorean Theorem (Pythagorean Theorem included on the reference sheet). 	<p style="text-align: center;">M11.D.1</p> <ul style="list-style-type: none"> • Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically. • Determine if a relation is a function given a set of points or a graph. • Identify the domain, range or inverse of a relation (may be presented as ordered pairs or a table). 	<p style="text-align: center;">M11.E.1</p> <ul style="list-style-type: none"> • Create and/or use appropriate graphical representations of data, including box-and-whisker plots, stem-and-leaf plots or scatter plots. • Analyze data and/or answer questions based on displayed data (box-and-whisker plots, stem-and-leaf plots or scatter plots).
<p style="text-align: center;">M11.A.2</p> <ul style="list-style-type: none"> • Solve problems using operations with rational numbers including rates and percents (single and multi-step and multiple procedure operations) (e.g., distance, work and mixture problems, etc.). • Solve problems using direct and inverse proportions. • Identify and/or use proportional relationships in problem solving settings. 	<ul style="list-style-type: none"> ➢ How does changing the length of the radius of a circle affect the circumference of the circle? ➢ How does changing the length of the edge of a cube affect the volume of the cube? ➢ How does changing the length of the base of a triangle affect the area of the triangle? 	<p style="text-align: center;">M11.C.2</p> <ul style="list-style-type: none"> • Calculate the distance and/or midpoint between 2 points on a number line or on a coordinate plane (formula provided on the reference sheet). • Relate slope to perpendicularity and/or parallelism (limit to linear algebraic expressions; slope formula provided on the reference sheet). 	<p style="text-align: center;">M11.D.2</p> <ul style="list-style-type: none"> • Solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities). • Identify or graph functions, linear equations or linear inequalities on a coordinate plane. • Write, solve and/or apply a linear equation (including problem situations). • Write and/or solve systems of equations using graphing, substitution and/or elimination (limit systems to 2 equations). • Solve quadratic equations using factoring (integers only – not including completing the square or the Quadratic Formula). • Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). • Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax^2+bx+c where a is not equal to 0). • Simplify algebraic fractions 	<p style="text-align: center;">M11.E.2</p> <ul style="list-style-type: none"> • Calculate or select the appropriate measure of central tendency (mean, mode or median) of a set of data given or represented on a table, line plot or stem-and-leaf plot. • Calculate and/or interpret the range, quartiles and interquartile range of data. • Describe how outliers affect measures of central tendency.
<p style="text-align: center;">M11.A.3</p> <ul style="list-style-type: none"> • Simplify/evaluate expressions involving positive and negative exponents, roots and/or absolute value (may contain all types of real numbers - exponents should not exceed power of 10). • Simplify/evaluate expressions involving multiplying with exponents (e.g. $x^6 * x^7 = x^{13}$), powers of powers (e.g., $(x^6)^7 = x^{42}$) and powers of products $(2x^2)^3 = 8x^6$ (positive exponents only). • Simplify/evaluate expressions using the order of operations to solve problems (any rational numbers may be used). • Use estimation to solve problems. 	<p style="text-align: center; font-size: 1.2em;">14% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">15% of PSSA</p>	<p style="text-align: center;">M11.D.3</p> <ul style="list-style-type: none"> • Identify, describe and/or use constant or varying rates of change. • Determine how a change in one variable relates to a change in a second variable (e.g., $y=4/x$, if x doubles, what happens to y?). • Apply the formula for the slope of a line to solve problems (formula given on reference sheet). • Given the graph of the line, 2 points on the line, or the slope and a point on a line, write or identify the linear equation in point-slope, standard and/or slope-intercept form. • Compute the slope and/or y-intercept represented by a linear equation or graph. 	<p style="text-align: center;">M11.E.3</p> <ul style="list-style-type: none"> • Find probabilities for independent, dependent or compound events and represent as a fraction, decimal or percent). • Find, convert and/or compare the probability and/or odds of a simple event. • Determine the number of permutations and/or combinations or apply the fundamental counting principle. (Formula provided on the reference sheet).
<p style="text-align: center; font-size: 1.2em;">14% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">14% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">15% of PSSA</p>	<p style="text-align: center;">M11.D.4</p> <ul style="list-style-type: none"> • Match the graph of a given function to its table or equation. 	<p style="text-align: center;">M11.E.4</p> <ul style="list-style-type: none"> • Estimate or calculate to make predictions based on a circle, line, bar graph or given situation. • Use probability to predict outcomes. • Draw, find and/or write an equation for a line of best fit for a scatter plot. • Make predictions using the equations or graphs of best-fit lines of scatter plots.
<p style="text-align: center; font-size: 1.2em;">14% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">14% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">15% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">42% of PSSA</p>	<p style="text-align: center; font-size: 1.2em;">15% of PSSA</p>

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Percent of Items Tested in Each Reporting Category - 2006 PSSA Mathematics Test
Source: eMetric

Actual Percentage Range ±4% in Previous Years

2008 - 2009 Eligible Content

MATH – GRADE 11