MATH – GRADE 6

Assessment Anchors & Eligible Content

Pennsylvania Department of Education

2007

M6.A Numbers and Operations

M6.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers, and number systems.

M6.A.1.1	Express numbers in equivalent forms.	**M6.A.1.1.1**	Represent common percents as fractions and/or decimals (e.g., 25% =¼ = .25) – common percents are 1%, 10%, 25%, 50%, 75%, 100%.
		M6.A.1.1.2	Convert between fractions and decimals and/or differentiate between a terminating decimal and a repeating decimal.
		M6.A.1.1.3	Represent a number in exponential form (e.g., $10x10x10=10^3$).
		M6.A.1.1.4	Represent a mixed number as an improper fraction.

M6.A Numbers and Operations

M6.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers, and number systems.

M6.A.1.2	Compare quantities and/or magnitudes of numbers.	**M6.A.1.2.1**	Compare and/or order whole numbers, mixed numbers, fractions and/or decimals (do not mix fractions and decimals – decimals through thousandths).

M6.A Numbers and Operations

M6.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers, and number systems.

M6.A.1.3	Apply number theory concepts (i.e., factors, multiples).	**M6.A.1.3.1**	Find the Greatest Common Factor (GCF) of two numbers (through 50) and/or use the GCF to simplify fractions.
		M6.A.1.3.2	Find the Least Common Multiple (LCM) of two numbers (through 50) and/or use the LCM to find the common denominator of two fractions.
		M6.A.1.3.3	Use divisibility rules for 2, 3, 5 and/or 10 to draw conclusions and/or solve problems.

M6.A Numbers and Operations

M6.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

M6.A.1.4	Use or develop models to represent percents.	**M6.A.1.4.1**	Model percents (through 100%) using drawings, graphs and/or sets (e.g., circle graph, base ten blocks, etc)

M6.A Numbers and Operations

M6.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.

M6.A.2.1	Select and/or use operations to simplify or solve problems.	**M6.A.2.1.1**	Complete equations by using the following properties: associative, commutative, distributive and identity.

M6.A Numbers and Operations

M6.A.3 Compute accurately and fluently and make reasonable estimates.

M6.A.3.1	Apply estimation strategies to a variety of problems.	**M6.A.3.1.1**	Use estimation to solve problems involving whole numbers and decimals (up to 2-digit divisors and 4 operations).

M6.B Numbers and Operations

M6.A.3 Compute accurately and fluently and make reasonable estimates.

M6.A.3.2	Solve problems with and without the use of a calculator.	**M6.A.3.2.1**	Solve problems involving operations (+, -, x, ÷) with whole numbers, decimals (through thousandths) and fractions (avoid complicated LCDs) - straight computation or word problems.

M6.B Measurement

M6.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

M6.B.1.1	Compare and/or determine elapsed time.	**M6.B.1.1.1**	Determine and/or compare elapsed time to the minute (time may cross AM to PM or more than one day).

M6.B Measurement

M6.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

M6.B.2.1	Choose or use appropriate tools and/or units to determine measurements within the same system.	**M6.B.2.1.1**	Use or read a ruler to measure to the nearest 1/16 inch or millimeter.
		M6.B.2.1.2	Choose the more precise measurement of a given object (e.g., smaller measurements are more precise).
		M6.B.2.1.3	Measure angles using a protractor up to 180° - protractor must be drawn - one side of the angle to be measured should line up with the straight edge of the protractor.

M6.B Measurement

M6.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

M6.B.2.2	Solve problems involving length, perimeter, area and/or volume of geometric figures.	**M6.B.2.2.1**	Find the perimeter of any polygon (may include regular polygons where only the measure of one side is given – same units throughout).

M6.B Measurement

M6.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

M6.B.2.3	Identify, label, and/or list properties of angles or triangles.	**M6.B.2.3.1**	Define, label and/or identify right, straight, acute and obtuse angles.

M6.C Geometry

M6.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

M6.C.1.1	Define and/or use basic properties of triangles, quadrilaterals, pentagons, hexagons, heptagons, octagons, nonagons, decagons and circles.	**M6.C.1.1.1**	Identify, classify and/or compare polygons (up to ten sides.)
		M6.C.1.1.2	Identify and/or describe properties of all types of triangles (scalene, equilateral, isosceles, right, acute, obtuse).
		M6.C.1.1.3	Identify and/or determine the measure of the diameter and/or radius of a circle (when one or the other is given).
		M6.C.1.1.4	Identify and/or use the total number of degrees in a triangle, quadrilateral and/or circle.

M6.C Geometry

M6.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

M6.C.1.2	Represent and/or use concepts and relationships of lines and line segments.	**M6.C.1.2.1**	Identify, describe and/or label parallel, perpendicular or intersecting lines.
		M6.C.1.2.2	Identify, draw and/or label points, planes, lines, line segments, rays, angles and vertices.

M6.C Geometry

M6.C.2 Identify and/or apply concepts of transformations or symmetry.

Not assessed at Grade 6.

M6.C Geometry

M6.C.3 Locate points or describe relationships using the coordinate plane.

M6.C.3.1	Identify, plot or match points given an ordered pair.	**M6.C.3.1.1**	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.

M6.D Algebraic Concepts

M6.D.1 Demonstrate an understanding of patterns, relations and functions.

M6.D.1.1	Create or extend patterns.	**M6.D.1.1.1**	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).

M6.D Algebraic Concepts

M6.D.1 Demonstrate an understanding of patterns, relations and functions.

M6.D.1.2	Analyze patterns.	**M6.D.1.2.1**	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).

M6.D Algebraic Concepts

M6.D.2 Represent and/or analyze mathematical situations and structures using algebraic symbols, words, tables, and graphs.

M6.D.2.1	Select and/or use appropriate strategies to solve number sentences.	**M6.D.2.1.1**	Identify the inverse operation needed to solve a one-step equation.
		M6.D.2.1.2	Solve a one-step equation (i.e., using the inverse operation -whole numbers only).

M6.D Algebraic Concepts

M6.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.

M6.D.2.2	Create and/or interpret expressions or equations that model problem situations.	**M6.D.2.2.1**	Match an equation or expression involving one variable, to a verbal math situation (one operation only).

M6.D Algebraic Concepts

M6.D.3 Analyze change in various contexts.

Not assessed at Grade 6.

M6.D Algebraic Concepts

M6.D.4 Describe or use models to represent quantitative relationships.

Not assessed at Grade 6.

M6.E Data Analysis and Probability

M6E.1 Formulate questions that can be addressed with data and/or collect, organize, display, and analyze data.

M6E.1.1	Interpret data shown in frequency tables, histograms, circle, bar or double bar graphs, line or double line graphs or line plots.	**M6.E.1.1.1**	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).
		M6.E.1.1.2	Choose the appropriate representation for a specific set of data (choices should be the same type of graph).
		M6.E.1.1.3	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. Circle graphs for open-ended items must show a center point and tic marks.

M6.E Data Analysis and Probability

M6.E.2 Select and use appropriate statistical methods to analyze data.

M6.E.2.1	Describe data sets using mean, median, mode and/or range.	**M6.E.2.1.1**	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).

M6.E Data Analysis and Probability

M6.E.3 Understand and apply basic concepts of probability.

M6.E.3.1	Determine all possible combinations, outcomes and/or calculate the probability of a simple event.	**M6.E.3.1.1**	Define and/or find the probability of a simple event (express as a fraction in lowest terms).
		M6.E.3.1.2	Determine/show all possible combinations involving no more than 20 total arrangements (e.g., tree diagram, table, grid).

M6.E Data Analysis and Probability

M6.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.

Not assessed at Grade 6.