

MATH - GRADE 7
Assessment Anchors & Eligible Content
Pennsylvania Department of Education
2007

M7.A Numbers and Operations

M7.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

M7.A.1.1 Express numbers in equivalent forms.

M7.A.1.1.1 Convert between fractions, decimals and/or percents (e.g., $20\% = 0.2 = 1/5$) (terminating decimals only).

M7.A Numbers and Operations

M7.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

M7.A.1.2 Compare quantities and/or magnitudes of numbers.

M7.A.1.2.1 Compare and/or order integers, mixed numbers, fractions and decimals (fractions and decimals may be mixed – no more than 5 numbers in a set to be ordered).

M7.A.1.2.2 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).

M7.A Numbers and Operations

M7.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.

M7.A.2.1 Complete calculations by applying the order of operations.

M7.A.2.1.1 Use the order of operations to simplify numerical expressions (may use parentheses, brackets, +, -, \times , \div , squares up to 10^2 and cubes up to 4^3 ; whole numbers only).

M7.A Numbers and Operations

M7.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.

M7.A.2.2 Solve problems using ratios, proportions, percents and/or rates.

M7.A.2.2.1 Write ratios to compare quantities (e.g., ratio of boys to girls).

M7.A.2.2.2 Solve for a variable in a given proportion.

M7.A.2.2.3 Use proportions to determine if two quantities are equivalent (e.g., similar figures, prices of different sized items, etc).

M7.A.2.2.4 Calculate and/or apply unit rates or unit prices (terminating decimals through the hundredth place only).

M7.A.2.2.5 Select and/or use ratios or proportions to solve problems.

M7.A.2.2.6 Use proportions to find the missing length of a side in similar figures.

M7.A Numbers and Operations

M7.A.3 Compute accurately and fluently and make reasonable estimates.

M7.A.3.1 Apply estimation strategies to a variety of problems.

M7.A.3.1.1 Estimate answers to problems involving whole numbers, decimals, fractions or mixed numbers.

M7.A Numbers and Operations

M7.A.3 Compute accurately and fluently and make reasonable estimates.

M7.A.3.2 Compute accurately with and without use of a calculator.

M7.A.3.2.1 Solve problems involving operations (+, -, x, ÷) of whole numbers, decimals, fractions, or mixed numbers (straight computation or word problems)

M7.A.3.2.2 Solve problems involving addition and subtraction of integers.

M7.B Measurement

M7.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.

M7.B.1.1 Add, subtract, or convert measurements.

M7.B.1.1.1 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)

M7.B Measurement

M7.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

M7.B.2.1 Develop, use and/or describe strategies to find the measure of length, perimeter, circumference, area or volume.

M7.B.2.1.1 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.

M7.B.2.1.2 Find the circumference and/or area of circles (formulas provided on the reference sheet).

M7.B.2.1.3 Find the area of triangles and/or all types of parallelograms (formulas provided on the reference sheet).

M7.B Measurement

M7.B.2 Apply appropriate techniques, tools and formulas to determine measurements.

M7.B.2.2 Construct, interpret and/or use scale drawings to solve real-world problems.

M7.B.2.2.1 Interpret and/or apply scales shown on maps, blueprints, models, etc.

M7.B.2.2.2 Determine and/or apply an appropriate scale for reduction or enlargement.

M7.C Geometry

M7.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

M7.C.1.1 Define and/or apply basic properties of two- and three-dimensional geometric shapes.

M7.C.1.1.1 Identify, describe and/or define diameter, radius, chord and/or circumference in circles.

M7.C.1.1.2 Solve problems involving the relationship between the radius and diameter of the same circle.

M7.C.1.1.3 Identify parallel, perpendicular and/or skew line segments within three-dimensional figures.

M7.C Geometry

M7.C.1 Analyze characteristics and properties of two- and three-dimensional geometric shapes and demonstrate understanding of geometric relationships.

M7.C.1.2 Identify congruence and/or similarity in polygons.

M7.C.1.2.1 Identify and/or use polygons that are similar and/or congruent, given either measurements or tic and angle marks.

M7.C.1.2.2 Identify corresponding sides and/or angles of congruent or similar polygons.

M7.C Geometry

M7.C.2 Identify and/or apply concepts of transformations or symmetry.

Not assessed at Grade 7.

M7.C Geometry

M7.C.3 Locate points or describe relationships using the coordinate plane.

M7.C.3.1 Locate, plot and/or describe points on a coordinate plane.

M7.C.3.1.1 Plot and/or identify ordered pairs on a coordinate plane (all four quadrants).

M7.C.3.1.2 Identify Quadrants I, II, III, IV, the x- & y-axes and the origin on a coordinate plane.

M7.D Algebraic Concepts

M7.D.1 Demonstrate an understanding of patterns, relations and functions.

M7.D.1.1 Recognize, reproduce, extend and/or describe patterns.

M7.D.1.1.1 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 \times
- whole numbers - may use only one operation from +, -, \times , \div or squares

M7.D Algebraic Concepts

M7.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.

M7.D.2.1 Select and/or use appropriate strategies to solve or represent equations or expressions.

M7.D.2.1.1 Select and/or use appropriate strategies to solve one-step equations (no negative numbers).

M7.D.2.1.2 Use substitution of one and/or two variables to simplify expressions (whole numbers only – use order of operations).

M7.D Algebraic Concepts

M7.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.

M7.D.2.2 Create and/or interpret expressions, equations or inequalities that model problem situations.

M7.D.2.2.1 Identify expressions, equations or inequalities that model mathematical situations (using whole numbers or decimals, no more than two operations and one variable).

M7.D Algebraic Concepts

M7.D.3 Analyze change in various contexts.

M7.D.3.1 Describe the relationship between two variables (e.g., time, temperature).

M7.D.3.1.1 Solve problems involving a constant rate of change (e.g., word problems, graphs or data tables).

M7.D.3.1.2 Describe and/or use the relationship of data displayed on a rate of change graph (e.g., how does the x-axis data relate to the y-axis data).

M7.D Algebraic Concepts

M7.D.4 Describe or use models to represent quantitative relationships.

Not assessed at Grade 7.

M7.E Data Analysis and Probability

M7.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.

M7.E.1.1

Interpret data shown in complex data displays.

M7.E.1.1.1

Analyze data and/or answer questions pertaining to data represented in histograms, double bar graphs, multiple line graphs or stem-and-leaf plots.

M7.E Data Analysis and Probability

M7.E.2 Select and/or use appropriate statistical methods to analyze data.

M7.E.2.1

Describe, compare and/or contrast data using measures of mean, median, mode or range.

M7.E.2.1.1

Identify/calculate the mean (average), median, mode or range of a set of data.

M7.E.2.1.2

Decide/choose which measure of central tendency (mean, median, mode or range) would be most appropriate for a given situation.

M7.E Data Analysis and Probability

M7.E.3 Understand and/or apply basic concepts of probability or outcomes.

M7.E.3.1

Determine theoretical or experimental probability.

M7.E.3.1.1

Find the theoretical probability of a simple and/or compound event (answer written as a fraction in lowest terms - any compound events should be independent)

M7.E.3.1.2

Find the theoretical probability of an event not occurring (e.g., what is the probability of not rolling a 1 on a number cube)

M7.E.3.1.3

Use data displayed in charts, graphs or tallies to find experimental probability

M7.E Data Analysis and Probability

M7.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.

M7.E.4.1

Draw conclusions and/or make predictions based on data displays.

M7.E.4.1.1

Formulate predictions and/or draw conclusions based on data displays (bar graphs, circle graphs or line graphs) or probability.