Grade 8 Mathematics

The grade 8 mathematics assessment presents a variety of items representing the six strands of the Wisconsin Model Academic Standards for Mathematics: Mathematical Processes *(Reasoning, Communication, Connections, Representation, Problem Solving)*, Number Operations and Relationships, Geometry, Measurement, Statistics and Probability, and Algebraic Relationships. Assessment items in each category may appear without context and within the context of real-world situations. All test items are either selected-response (multiple-choice) or constructed response format. Some items require the use of mathematical tools including a protractor, a ruler with 1/16 inch and millimeter intervals, and a calculator (four-function calculator availability is required for most sessions of the test). Students performing at each level draw on a broad range of mathematical knowledge while applying skills and strategies to solve real-world and nonroutine mathematical problems. Each proficiency level presumes mastery at previous levels.

Advanced
(573 and above)

At the beginning of eighth grade, students performing at the Advanced level formulate mathematical representations and communicate and justify mathematical ideas clearly and concisely in written form. Students calculate discounts and sales tax using fractions and percents, estimate products of decimals to the nearest whole number, find the least common multiple of numbers, and identify equivalent forms for fractions, decimals and percents. Students name three-dimensional figures using correct terminology, break polygons into triangles, solve for the sum of angles in a polygon, and apply proportional reasoning to solve problems related to similar geometric figures. They use understanding of transformational geometry to locate or plot geometric shapes in any of the four quadrants of a coordinate plane. Students use and convert between US customary and metric units of measure; measure to the nearest 1/16 inch or millimeter; measure angles up to 360°; determine area of circles; and determine volume and surface area of rectangular prisms and cylinders. Students calculate the mean and median of a set of unordered data and analyze data from various graphs, including circle graphs. They estimate the probability of an outcome not occurring and determine the number of combinations in a set. Students extend numeric patterns in sequences or functional relationships using multiplication and exponents without a calculator, represent numerical patterns with algebraic expressions, and apply the distributive property to solve real-world problems.

Proficient
(513-572)

At the beginning of eighth grade, students performing at the Proficient level clearly communicate mathematical processes and explain ideas and reasoning using mathematical terminology, numbers, symbols, graphs and diagrams. Students add and subtract mixed numbers and fractions with unlike denominators, multiply mixed numbers in real-world contexts, compare percents and fractions, and use percents in simple real-world problems. Students use proportional

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reasoning to find the length of sides of similar figures and determine supplementary and complementary angles. They locate and plot coordinates of a transformation in any of the four quadrants of a coordinate plane. Students use appropriate tools of measurement to measure the distance between two points to the nearest 1/8 inch or millimeter, solve problems involving area, perimeter and circumference, and find the volume of rectangular prisms. Students interpret and compare data contained in double bar graphs and determine the probability of one or two dependent or independent events. Students extend functional relationships, solve algebraic equations with like terms without a calculator, and evaluate algebraic expressions with exponents.

Basic
(483-512)

At the beginning of eighth grade, students performing at the Basic level use basic mathematical terminology, symbols or numbers to explain and support their problem solving strategies. Students recognize and apply place value concepts, and estimate the sum and difference of whole numbers, common fractions and mixed numbers in problem-solving situations without the use of a calculator. Students determine measurements of complementary angles and congruency between multiple figures. They identify, locate and plot coordinates of a transformation for a point across the x-axis or y-axis. Students select appropriate tools to measure to the nearest ¼ inch or millimeter, measure liquid capacity and measure angles up to 90°. Students read bar graphs, interpret scales, and extract and interpret data from linear graphs when solving real-world problems. Students determine the probability of events based on one independent event and the number of combinations in a given set of data. Students find missing terms in sequences and functional relationships without a calculator, apply the rules for order of operations, and evaluate algebraic expressions containing two operations. They use commutative and associative properties to solve problems.

Minimal Performance
(482 and below)

At the beginning of eighth grade, students performing at the Minimal Performance level communicate mathematical processes used to solve simple problems by providing limited details with some supporting information using words or pictures in their explanations. They identify equivalent forms of fractions, decimals and percents without the use of calculators, and estimate sums and differences of whole numbers and common fractions in problem-solving situations. Students classify angles as acute, obtuse or right, describe the attributes of similar geometric figures, and identify and locate coordinates in all four quadrants of a coordinate plane. They use appropriate US customary and metric tools to estimate and measure distances between points to the nearest inch or centimeter and determine the diameter, radius and area of a circle. They read and

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interpret line graphs and list all possible outcomes of an event. Students may extend numeric and geometric patterns, apply the commutative and associative properties, and evaluate and solve one-step algebraic equations without a calculator.

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