

## Grade 7 Mathematics

The grade 7 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** (555 and above)

At the beginning of seventh grade, students performing at the Advanced level justify and clearly communicate mathematical problem solving strategies with detailed explanations using words, numbers and symbols. They reason, connect and represent mathematical processes in real-world situations. Students compare, order, add and subtract decimals to the thousandth place, and solve problems using concepts of least common multiple and prime and composite numbers. They apply proportional reasoning in context, calculate percentage, and convert between fractions and decimals with and without a calculator. Students analyze attributes of three-dimensional figures, rotate simple geometric shapes, and differentiate between similar and congruent shapes. They use properties and relationships of quadrilaterals to determine area and perimeter, and use ordered pairs to locate points on the first quadrant of a coordinate grid. Students measure angles of more than  $90^\circ$ , estimate lengths to the nearest  $\frac{1}{4}$  inch, and perform multi-step conversions for distance and weight with and without conversion tables. They perform conversions for liquid capacity with a conversion table. Students determine mean and mode with an odd numbered set of data within context; create stem-and-leaf plots; extract information in a given context; and solve simulations involving probability. Students explain complex numerical sequences using pictures and numbers, solve two-step equations with whole number coefficients, and solve three-step algebraic problems involving order of operations.

### **Proficient** (504-554)

At the beginning of seventh grade, students performing at the Proficient level connect problem solving strategies to real-world problems and clearly communicate their strategies and reasoning by providing details using mathematical terminology, words and symbols. Students estimate sums of six-digit numbers and demonstrate knowledge of decimal place value up to the ten-thousandths place by comparing and ordering decimals. Students predict rotation of figures

on and off a grid and identify plotted points on the first quadrant coordinate grid. Students determine the distance between two points on a map with a scale and use a protractor to measure angles. Students analyze information from data tables and graphs to state rules and formulate hypotheses, express probability in fractional form, and predict the likelihood of an independent event presented in real-world contexts. Students use the associative property, commutative property, and order of operations to evaluate expressions and solve equations.

**Basic**  
(480-503)

At the beginning of seventh grade, students performing at the Basic level use basic mathematical terminology, symbols or numbers to communicate strategies used to solve multi-step problems and support their problem solving strategies. Students divide two-digit dividends by single-digit divisors, determine cost using a calculator, and use addition and subtraction to problems involving monetary contexts. Students identify congruent and similar figures, identify attributes of three-dimensional shapes, and locate x and y-numbered coordinates plotted on the first quadrant of a coordinate grid. Students select appropriate units of measure, estimate length to the nearest unit, and solve simple real-world problems with area and perimeter. They create single bar graphs from sets of information, extract information from single bar graphs, and interpret data presented in circle graphs with and without context. They determine the number of combinations when choosing for items. Students describe relationships between two variables, solve simple one-step algebraic equations, and identify equivalent numerical expressions using the commutative and associative properties. They complete numeric patterns.

**Minimal Performance**  
(479 and below)

At the beginning of seventh grade, students performing at the Minimal Performance level communicate mathematical problem solving strategies by providing some details with brief, supporting information. Students may compare, order, add and subtract numbers less than 100,000, and use the commutative property of addition to solve simple word problems with single-digit numbers. Students identify attributes of three-dimensional shapes (e.g. face, side, edge, base) and simple congruent and similar figures. They perform simple conversions using the US customary system of measurement given a conversion table, and they determine area and perimeter of simple quadrilaterals. Students interpret information from a single bar graph and predict the outcome of simple events. Students may extend numeric patterns and describe algebraic equations in word form.