

## 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**

Score range: 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. Students compare, order, add, and subtract decimals to the thousandth place, and solve problems using concepts of least common multiples and prime and composite numbers. Students apply proportional reasoning in context, calculate percentages, and convert between fractions and decimals with and without calculators. Students analyze three-dimensional figures, rotate simple geometric figures, and analyze and differentiate between similar and congruent shapes. Students use properties and relationships of quadrilaterals to determine area and perimeter. They measure angles of more than  $90^\circ$ , and estimate lengths to the nearest  $\frac{1}{4}$  inch. They perform multi-step customary conversions for weight and distance with and without conversion tables and conversions for liquid capacity with a conversion table. They determine mean and mode, create stem-and-leaf plots, extract information from sets of data, and solve simulations involving probability. Students explain complex numerical sequences, solve two-step equations with whole number coefficients, and solve three-step algebraic problems involving order of operations.

### **Proficient**

Score range: 504– 554

At the beginning of seventh grade, students performing at the Proficient level clearly communicate mathematical problem solving strategies and reason and connect mathematical problem solving strategies to real-world situations. Students solve problems involving place value up to the ten-thousandth place and to the hundredths place, including comparing and ordering decimals. Students predict rotations of figures on and off a grid. They determine distances on a map containing a scale and measure angles with a protractor. Students formulate a hypothesis based on information from a bar graph or circle graph, analyze information from data tables to state rules or to state a hypothesis based on data, predict the likelihood of an event, and

express probability as a fraction. Students use the associative property, commutative property, and order of operations to evaluate expressions and solve equations.

**Basic**

Score range: 480– 503

At the beginning of seventh grade, students performing at the Basic level use basic mathematical terminology, symbols or numbers to support their problem solving strategies. Students divide two-digit dividends by single-digit divisors, calculate cost using a calculator, and use addition and subtraction to solve problems involving monetary contexts. They identify attributes of three-dimensional figures and locate coordinates plotted on the first quadrant of a coordinate grid. Students select appropriate units of measurement, estimate length to the nearest unit, and determine area and perimeter. They create bar graphs from sets of information, interpret information in bar graphs and circle graphs, and determine the number of combinations when choosing four 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**

Score range: 479 and below

At the beginning of seventh grade, students performing at the Minimal Performance level communicate mathematical problem solving strategies used to solve simple problems and provide some detail using words and/or pictures in their explanations. Students may compare, order, add, and subtract whole numbers less than 100,000, solve simple word problems using addition, and use the commutative property for addition of single-digit numbers. Students identify attributes of three-dimensional shapes and congruent and similar figures. Students may perform conversions using the US customary system of measurement given a conversion table, and determine area and perimeter of simple quadrilaterals with the aid of a diagram. They may 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.