

Grade 10 Mathematics

The grade 10 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 calculators (scientific or graphing 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. *The descriptions provide examples, rather than a complete list, of knowledge and skills students may demonstrate at each level.*

Performance Level	WKCE-CRT Performance Level Descriptions and Scale Score Ranges
Advanced 595 and above	<p>At the beginning of the year, students at the Advanced level demonstrate in-depth understanding of academic knowledge and skills tested on the WKCE-CRT by:</p> <ul style="list-style-type: none"> • using reasoning and logic skills to determine valid and extraneous information. • providing detailed explanation regarding the reasonableness of conclusions based on calculations, models and arguments using the Pythagorean Theorem, logical reasoning and data analysis. • verifying and explaining a mathematical conjecture. • applying proportional reasoning in a mathematical and real-world context. • solving and analyzing real-world problems using routine and nonroutine methods • analyzing and solving problems using percents in real-world context • describing transformations of complex figures. • reflecting a geometric figure over a line of symmetry on a coordinate plane. • classifying and analyzing geometric figures using geometric properties and theorems. • evaluating the validity of a geometric argument using logical reasoning. • applying attributes of two-dimensional geometric figures to determine coordinates on two-dimensional quadrant grids. • applying the conditions of parallel lines. • locating the X and Y intercepts graphically without a calculator. • converting between multiple units of measurement in mathematical and real-world contexts. • calculating the area of two-dimensional shapes and the surface area of three-dimensional figures. • connecting and applying relationships between angles to solve real-world problems. • modeling and verifying geometric arguments using the Pythagorean Theorem. • applying the Pythagorean Theorem to solve problems involving right triangles. • finding the midpoint between points in a coordinate plane using the midpoint formula. • calculating the distance between points in a coordinate plane using the distance formula. • comparing and analyzing values to statistical data given box-and-whisker plots.

Performance Level	WKCE-CRT Performance Level Descriptions and Scale Score Ranges
	<ul style="list-style-type: none"> • creating a scatter plot with appropriate scale and labels and analyze the data. • identifying appropriate ranges of values using standard deviations. • analyzing the effect of outliers on the mean for a set of data. • calculating the probability or outcomes of events with or without replacement and using fundamental counting principles. • analyzing data from a table in order to draw conclusions. • generalizing patterns of various sequences. • translating a set of ordered pairs into a linear equation without a calculator. • translating information from a real-world context into linear equations and representing it numerically, algebraically or graphically. • demonstrating an understanding of algebraic properties by solving quadratic equations. • solving problems involving the conversion of customary and metric units of measurement. • using measurement tools to solve multi-step problems involving a scale (key).
Proficient 541 - 594	<p>At the beginning of the year, students at the Proficient level demonstrate competency in the academic knowledge and skills tested on the WKCE-CRT by:</p> <ul style="list-style-type: none"> • providing justifications for solutions and providing details to support reasoning. • solving problems involving familiar percents in real-world contexts. (e.g. commission) • identifying, locating or plotting coordinates of geometric figures transformed in a coordinate plane. • applying concepts of proportion to solve and extend problems involving similarity. • applying relationships between angles and circles to solve real-world problems. • converting between units of measurement. • applying measurement tools to solve problems and to calculate the area of two-dimensional shapes. • using the Pythagorean Theorem, distance or midpoint formulas to solve basic problems. • creating a scatter plot with appropriate scale and labels. • calculating the median of a set of data in a real-world setting. • analyzing the design of statistical experiments. • comparing and interpreting the results of a survey given in a graphical representation. • calculating the probability of an event other than the first occurrence. • Determining a rule for patterns and extending patterns in real-world context. • interpreting the graph of a quadratic relationship of two-real world quantities. • subtracting values for multiple variables and solving the equation. • applying algebraic properties to solve a multi-step non-linear equation or inequality.
Basic 516 –540	<p>At the beginning of the year, students at the Basic level demonstrate some academic knowledge and skills tested on the WKCE-CRT by:</p> <ul style="list-style-type: none"> • representing processes in real-world situations and providing justifications for solutions. • identifying information necessary to solve real-world problems.

Performance Level	WKCE-CRT Performance Level Descriptions and Scale Score Ranges
	<ul style="list-style-type: none"> • explaining the reasonableness of solutions. • adding, subtracting, multiplying and dividing integers in mathematical and real-world contexts. • recognizing relationships between supplementary angles. • identifying similar geometric figures using ratios. • determining the slope of a line. • calculating the length of any side of a right triangle when given the other two sides. • approximating linear and area measurements. • selecting appropriate tools of measurement to solve problems. • converting between US customary and metric systems of measure. • interpreting and translating graphical representations of real-world phenomena of linear and non-linear data. • identifying appropriate sample sets when conducting a survey. • predicting values beyond the range of a linear graph. • calculating the probability of single events. • analyzing the rate of change as expressed graphically between two sets of real-world data. • translating a verbal problem into a linear expression with one variable. • demonstrating an understanding of algebraic properties while solving multi-step linear equations or inequalities.
<p>Minimal Performance</p> <p>515 and below</p>	<p>At the beginning of the year, students at the Minimal level demonstrate very limited academic knowledge and skills tested on the WKCE-CRT by:</p> <ul style="list-style-type: none"> • communicating mathematical ideas using simple explanations to support conclusions. • comparing and ordering real numbers. • adding and subtracting decimals without the use of a calculator. • classifying two- and three-dimensional figures. • identifying corresponding parts of congruent geometric figures. • using a four quadrant coordinate grid to determine locations of more than one ordered pair. • selecting and using appropriate tools of measurement to the nearest inch. • converting between US customary and metric systems of measurement to solve problems. • determining the mean, median, mode and range of an even or odd set of data. • Predicting the likelihood of a single event. • analyzing data from tables and linear graphs. • interpreting relationships demonstrated by linear graphs. • identifying the graph of a constant fraction. • applying associative, commutative or distributive properties to multi-step algebraic equations.