

Nevada Grade 4 Mathematics Item Specifications

Grade 4 CRT Item Specifications – Number and Operations		
Content Standard 1.0 Students will accurately calculate and use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.		
“Enduring and Important Knowledge” identified in previous grade-levels may be included within the context of some problems.		
Assessed Indicators	Depth of Knowledge Essence (*)	Item Specifications and Assessment Development Notes
1.4.1 Place Value Identify and use place value positions of whole numbers to one million	DOK 1	Items may ask students to identify place value positions, identify the value of a given digit, and change the standard form of a number to its expanded form and vice versa.
1.4.2 Fractions Identify fractions and compare fractions with like denominators using models, drawings, and numbers.	DOK 1	Fractions are limited to denominators less than or equal to 12. When comparing fractions in multiple-choice items, the caret symbol (^) may be used as a distracter.
1.4.3 Comparing and Ordering Read, write, compare, and order whole numbers. Read and write number words.	DOK 1	When comparing numbers, the caret symbol (^) may be used as a distracter. Computation is not required. Numbers up to 1,000,000 may be used. When ordering, a maximum of 5 numbers may be used.
1.4.5 Facts Immediately recall and use multiplication and corresponding division facts (products to 144).	DOK 1	Multiplication and corresponding division facts up to 12×12 .
1.4.6 Estimation Estimate to determine the reasonableness of an answer in mathematical and practical situations.	DOK 2	Answer choices may be ranges of numbers. The extremes of each range must be multiples of 5 Items may ask students to estimate quantities of objects. Items may ask students to estimate computational results. Rounding is an estimation skill that may be assessed.
1.4.7 Computation Add and subtract multi-digit numbers. Multiply and divide multi-digit numbers by a one-digit whole number with regrouping, including monetary amounts as decimals.	DOK 1	Sums and products may not exceed 10,000. Division remainders may be expressed as whole numbers or terminating decimals (through the hundredths) (e.g., \$5.35 divided equally among 5 people). Adding and subtracting money is assessed in 3.4.4.
1.4.8 Solving Problems Generate and solve addition, subtraction, multiplication, and division problems using whole numbers in practical situations.	DOK 2	Items requiring addition, subtraction, or multiplication may be one-step or two-step computation with up to two different operations. Items requiring division are limited to one-step computation. No remainders are allowed. Limit numbers to 10,000.

(*) = 50% of the assessed items must be at or above the Depth of Knowledge Essence

Nevada Grade 4 Mathematics Item Specifications

Grade 4 CRT Item Specifications - Algebra		
Content Standard 2.0 Students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions and algebraic relations as modeled in practical situations to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.		
“Enduring and Important Knowledge” identified in previous grade-levels may be included within the context of some problems.		
Assessed Indicators	Depth of Knowledge Essence (*)	Item Specifications and Assessment Development Notes
2.4.1 Patterns Identify, describe, and represent patterns and relationships in the number system, including arithmetic and geometric sequences.	DOK 2	Patterns must be repeated 3 times. Patterns should be number patterns or number patterns represented by geometric shapes. Arithmetic patterns may increase or decrease. Geometric patterns may only increase (multiply by a whole number). Items may ask students to identify a missing term within the pattern Items may ask students to extend a pattern beyond the next term in the pattern. Items may ask students to describe a rule(s) for a pattern using words or symbols (e.g., ‘add three’ or ‘+3’), or may ask students to create a pattern using a rule.
2.4.2 Variables and Unknowns Model, explain, and solve open number sentences involving addition, subtraction, multiplication, and division. Select the solution to an equation from a given set of numbers.	DOK 1	Number sentences should be equations or inequalities using whole numbers with one missing value. An operation may be included on both sides of the number sentence. Numbers may be up to 10,000.
2.4.3 Number Sentences Complete number sentences with the appropriate words and symbols (+, -, x, ÷, >, <, =).	DOK 1	Items may ask students to complete simple number sentences. Items may ask students to compare two basic number facts: (e.g., $2 \times 3 \square 6 + 4$). Items may use the caret symbol (^) as a distracter.

(*) = 50% of the assessed items must be at or above the Depth of Knowledge Essence

Nevada Grade 4 Mathematics Item Specifications

Grade 4 CRT Item Specifications - Measurement		
Content Standard 3.0 Students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.		
“Enduring and Important Knowledge” identified in previous grade-levels may be included within the context of some problems.		
Assessed Indicators	Depth of Knowledge Essence (*)	Item Specifications and Assessment Development Notes
<p>3.4.1 Estimation and Conversion Estimate and convert units of measure for length, area, and weight within the same measurement system (customary and metric).</p> <p><i>Estimate temperature in practical situations. (Not assessed on State CRT)</i></p>	DOK 1	<p>Customary units for length include inch, foot, yard, and mile. Metric units for length include millimeter, centimeter, meter, and kilometer.</p> <p>Customary units for weight include ounce, pound, and ton. Metric units for weight include milligram, gram, and kilogram.</p> <p>Estimates should not require computation. For estimating area, irregular polygons must be drawn on a grid to show the number of square units in the figure.</p> <p>Conversion problems should require only one conversion factor to be imbedded.</p>
<p>3.4.2 Precision in Measurements Measure length, area, temperature, and weight to a required degree of accuracy in customary and metric systems.</p>	DOK 1	<p>Students will be provided a ruler.</p> <p>Students may be asked to measure the following: length to the nearest 1/4-inch or the nearest centimeter, temperature to the nearest degree Fahrenheit, and weight to the nearest ounce, pound, gram, or kilogram.</p> <p>For items assessing area, items must use figures that can be divided into rectangular shapes. Figures must be shown on a grid.</p> <p>Figures may not be rectangles or squares. These figures are assessed in 3.4.3</p>
<p>3.4.3 Formulas Define and determine the perimeter of polygons and the area of rectangles, including squares.</p>	DOK 1	<p>For area, rectangles/squares must be on a grid to show the number of square units in the figure.</p> <p>For perimeter, polygons must be on a grid or must have side lengths labeled. Items involving perimeter may ask students to determine the missing length of a side of a polygon, given the lengths of the other sides and the perimeter.</p> <p>For perimeter, a graphic must be shown.</p>

(*) = 50% of the assessed items must be at or above the Depth of Knowledge Essence

Nevada Grade 4 Mathematics Item Specifications

Assessed Indicators	Depth of Knowledge Essence (*)	Item Specifications and Assessment Development Notes
<p>3.4.4 Money Determine totals for monetary amounts in practical situations.</p> <p>Use money notation to add and subtract given monetary amounts.</p>	DOK 2	<p>Items should not provide diagrams of money (coins and bills).</p> <p>Items may ask students to add or subtract given monetary amounts without context.</p>
<p>3.4.6 Time Use A.M. and P.M. appropriately in describing time.</p> <p>Use elapsed time in quarter-hour increments, beginning on the quarter-hour, to determine start, end, and elapsed time.</p> <p>Recognize the number of weeks in a year, days in a year, and days in a month.</p>	DOK 2	<p>Start and end times must be on the quarter-hours (e.g. :00, :15, :30, :45). Elapsed time is in quarter-hour increments.</p> <p>Graphic representations may be either digital or analog clocks.</p> <p>Items may ask questions about the appropriateness of time (e.g., Which best describes the time a movie could start in the evening?).</p> <p>Items may include start time (represented on a clock) and amount of elapsed time and ask students to determine end time.</p> <p>For start time, items should include end time (represented on a clock) and amount of elapsed time and ask students to determine start time.</p> <p>For all elapsed time items a representation of at least one clock should be included.</p>

(*) = 50% of the assessed items must be at or above the Depth of Knowledge Essence

Nevada Grade 4 Mathematics Item Specifications

Grade 4 CRT Item Specifications - Geometry		
Content Standard 4.0 Students will identify, represent, verify, and apply spatial relationships and geometric properties to solve problems, communicate, and make connections within and beyond the field of mathematics.		
“Enduring and Important Knowledge” identified in previous grade-levels may be included within the context of some problems.		
Assessed Indicators	Depth of Knowledge Essence (*)	Item Specifications and Assessment Development Notes
4.4.1 Two-Dimensional Shapes Identify, draw, and classify angles including straight, right, obtuse, and acute.	DOK 1	Angles are limited to straight, right, obtuse, and acute.
4.4.2 Congruence, Similarity, and Transformations Identify shapes that are congruent, similar, and/or symmetrical using a variety of methods including transformational motions.	DOK 1	Items that focus on identification of symmetry are limited to line symmetry only. Items are limited to one transformation only. Items may use the word “trace” as a 4 th distracter for identification of transformational motion. Rotations are limited to 90°. Shapes may be on a grid.
4.4.3 Coordinate Geometry and Lines of Symmetry Identify coordinates for a given point in the first quadrant. Locate points of given coordinates on a grid in the first quadrant.	DOK 1	Coordinate grids must be scaled by ones.
4.4.4 Three-Dimensional Figures Identify, describe, and classify two- and three-dimensional figures by relevant properties including the number of vertices, edges, and faces using models.	DOK 2	Item must focus on attribute(s) of a figure. Two-dimensional figures include circle, triangle, rectangle, square, rhombus, pentagon, hexagon, octagon, and trapezoid. Three-dimensional figures include cube, cone, sphere, rectangular prism, triangular prism, and cylinder.
4.4.6 Lines, Angles, and their Properties Identify, draw, label, and describe points, line segments, rays, and angles.	DOK 1	Line may also be assessed.

(*) = 50% of the assessed items must be at or above the Depth of Knowledge Essence

Nevada Grade 4 Mathematics Item Specifications

Grade 4 CRT Item Specifications – Data Analysis		
Content Standard 5.0 Students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections to solve problems, communicate, reason, and make connections within and beyond the field of mathematics.		
“Enduring and Important Knowledge” identified in previous grade-levels may be included within the context of some problems.		
Assessed Indicators	Depth of Knowledge Essence (*)	Item Specifications and Assessment Development Notes
<p>5.4.1 Data Collection and Organization <i>Pose questions that can be used to guide the collection of categorical and numerical data.</i> <i>(Not on state CRT)</i></p> <p>Organize and represent data using a variety of graphical representations including frequency tables and line plots.</p>	DOK 2	<p>Data displays may include tables/charts, bar graphs, frequency tables, number lines, pictographs, or line plots.</p> <p>Frequency tables may display categorical or numerical data.</p> <p>Line plots on the state CRT will not have arrows.</p> <p>Items may ask student to select the correct data display given a set of data.</p> <p>Items may ask students to read a data display.</p> <p>Items may ask a simple question about a data display (e.g., How many students chose blue as their favorite color?).</p> <p>In Constructed Response items students may be asked to construct a data display that represents a given set of data.</p> <p>In Constructed Response items students may be asked to explain why a data display is incorrect.</p>
<p>5.4.3 Interpretation of Data Interpret data and make predictions using frequency tables and line plots.</p>	DOK 2	<p>Items that ask students to interpret data and make predictions are limited to frequency tables and line plots.</p> <p>Items may ask students to compare data in a data display or to perform calculations to answer questions about a data display (e.g., How many more students chose blue than red?).</p>

(*) = 50% of the assessed items must be at or above the Depth of Knowledge Essence