



**2012–2013  
Grade 8**

This three part document serves as a guide for the transition from the Nevada State Standards (NSS) to the Common Core State Standards (CCSS). Users of this document should also refer to the Grade 8 Introduction and Narrative, and the Glossary of the CCSS.

Part I: The tables below list the Common Core State Standards introduced or maintained in Grade 8 in school year 2012–2013. Corresponding Nevada State Standards are listed where the content matches in whole or in part. Teachers are expected to maintain the NSS as well as teach the CCSS. In many cases, the expectations of the CCSS exceed the NSS. Teachers must move their instruction, and therefore their students’ mathematical knowledge, from the level of the NSS to these CCSS. Teachers must also incorporate the *Standards for Mathematical Practice* into instruction to complete students’ educational experiences. Additional clarification is provided in the comments for some CCSS. Cells shaded gray indicate CCSS introduced in school year 2011–2012 that must be maintained.

<b>The Number System</b>			
<b>Know that there are numbers that are not rational, and approximate them by rational numbers.</b>			
<b>Common Core State Standard (CCSS)</b>	<b>Nevada State Standard (NSS)</b>	<b>Change<sup>1</sup></b>	<b>Comments</b>
8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.			
8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi^2$ ). For example, by truncating the decimal expansion of $\sqrt{2}$ , show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.	1.8.3 Compare and order real numbers, including powers of whole numbers in mathematical and practical situations.	0	
	1.12.6 Determine an approximate value of radical and exponential expressions using a variety of methods.	-1	Extend determining values of radicals in the NSS to include cube roots, and using a variety of techniques.

<b>Expressions and Equations</b>			
<b>Work with radicals and integer exponents.</b>			
<b>Common Core State Standard (CCSS)</b>	<b>Nevada State Standard (NSS)</b>	<b>Change<sup>1</sup></b>	<b>Comments</b>
8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$ .	1.12.7 Solve mathematical problems involving exponents and roots.  Perform addition, subtraction, and scalar multiplication on matrices.	-1	

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)



<b>Expressions and Equations</b>			
<b>Work with radicals and integer exponents.</b>			
<b>Common Core State Standard (CCSS)</b>	<b>Nevada State Standard (NSS)</b>	<b>Change<sup>1</sup></b>	<b>Comments</b>
8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ , where $p$ is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	1.8.5 Identify perfect squares to 225 and their corresponding square roots.	0	Extend identifying squares and square roots in the NSS to cubes and their corresponding cube roots.
	1.12.7 Solve mathematical problems involving exponents and roots.  Perform addition, subtraction, and scalar multiplication on matrices.	-1	“Knowing” that $\sqrt{2}$ is irrational requires students to justify why it is.
8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. <i>For example, estimate the population of the United States as <math>3 \times 10^8</math> and the population of the world as <math>7 \times 10^9</math>, and determine that the world population is more than 20 times larger.</i>	1.8.1 Represent numbers using scientific notation in mathematical and practical situations.	0	Extend to comparing (finding ratios) numbers in scientific notation.
8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	1.8.1 Represent numbers using scientific notation in mathematical and practical situations.	0	Extend representing numbers in scientific notation in the NSS to choosing units and interpreting as specified by this CCSS.
	1.8.7 Calculate with real numbers to solve mathematical and practical situations.  Use order of operations to solve equations in the real number system.	0	
<b>Understand the connections between proportional relationships, lines, and linear equations.</b>			
<b>Common Core State Standard (CCSS)</b>	<b>Nevada State Standard (NSS)</b>	<b>Change<sup>1</sup></b>	<b>Comments</b>
8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. <i>For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.</i>	4.12.5 Determine the slope of lines using coordinate geometry and algebraic techniques.  Identify parallel, perpendicular, and intersecting lines by slope.  Graph linear equations and find possible solutions to those equations using coordinate geometry.  Find possible solution sets of systems of equations whose slopes indicate parallel, perpendicular, or intersecting lines.	-1	Extend the computation of slope and the graphing of lines in the NSS to the level and extent defined by this CCSS.

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)



**Expressions and Equations**

**Understand the connections between proportional relationships, lines, and linear equations.**

Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.EE.6 Use similar triangles to explain why the slope $m$ is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at $b$ .			

**Analyze and solve linear equations and pairs of simultaneous linear equations.**

Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.EE.7 Solve linear equations in one variable.  a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$ , $a = a$ , or $a = b$ results (where $a$ and $b$ are different numbers).			
8.EE.7 Solve linear equations in one variable.  b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the Distributive property and collecting like terms.	2.8.2 Evaluate formulas and algebraic expressions using rational numbers (with and without technology).  Solve and graphically represent equations and inequalities in one variable, including absolute value.	0	
	2.8.5 Solve linear equations and represent the solution graphically.  Solve inequalities and represent the solution on a number line.	0	

**Functions**

**Define, evaluate, and compare functions.**

Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	2.8.4 Identify, model, describe, and evaluate functions (with and without technology).  Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations (with and without technology).	0	

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)



<b>Functions</b>			
<b>Define, evaluate, and compare functions.</b>			
<b>Common Core State Standard (CCSS)</b>	<b>Nevada State Standard (NSS)</b>	<b>Change<sup>1</sup></b>	<b>Comments</b>
8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). <i>For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.</i>	2.8.4 Identify, model, describe, and evaluate functions (with and without technology).  Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations (with and without technology).	0	Extend work with functions in the NSS to comparing functions in multiple forms.
8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. <i>For example, the function <math>A = s^2</math> giving the area of a square as a function of its side length is not linear because its graph contains the points (1, 1), (2, 4) and (3, 9), which are not on a straight line.</i>	2.7.5 Identify linear equations and inequalities.  Model and solve equations using concrete and visual representations.	+1	These topics were not explicitly part of the NSS, but implied in graphing linear equations in two variables.
	4.12.5 Determine the slope of lines using coordinate geometry and algebraic techniques.  Identify parallel, perpendicular, and intersecting lines by slope.  Graph linear equations and find possible solutions to those equations using coordinate geometry.  Find possible solution sets of systems of equations whose slopes indicate parallel, perpendicular, or intersecting lines.	-1	These topics were not explicitly part of the NSS, but implied in graphing linear equations in two variables.
<b>Use functions to model relationships between quantities.</b>			
<b>Common Core State Standard (CCSS)</b>	<b>Nevada State Standard (NSS)</b>	<b>Change<sup>1</sup></b>	<b>Comments</b>
8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	2.8.4 Identify, model, describe, and evaluate functions (with and without technology).  Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations (with and without technology).	0	Explicitly connect slope to the term “rate of change,” and y-intercept to “initial value.”
	4.8.5 Calculate slope, midpoint, and distance using equations and formulas (with and without technology).  Determine the x- and y-intercepts of a line.	0	Explicitly connect slope to the term “rate of change,” and y-intercept to “initial value.”

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)



**Functions**

**Use functions to model relationships between quantities.**

Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	2.8.4 Identify, model, describe, and evaluate functions (with and without technology).  Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations (with and without technology).	0	Extend work with functions in the NSS to include the analysis of linear and non-linear relationships.

**Geometry**

**Understand and apply the Pythagorean Theorem.**

Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.G.6 Explain a proof of the Pythagorean Theorem and its converse.	4.8.7 Verify and explain the Pythagorean Theorem using a variety of methods.  Determine the measure of the missing side of a right triangle.	0	Extend verifying and explaining the Pythagorean Theorem in the NSS to a proof of it.
8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	4.12.7 Apply the Pythagorean Theorem and its converse in mathematical and practical situations.	-1	Extend the application of the Pythagorean Theorem in the NSS to three-dimensional situations.
8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	4.8.5 Calculate slope, midpoint, and distance using equations and formulas (with and without technology).  Determine the $x$ - and $y$ -intercepts of a line.	0	
	4.12.7 Apply the Pythagorean Theorem and its converse in mathematical and practical situations.	-1	

**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.**

Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	3.12.3 Select and use appropriate measurement tools, techniques, and formulas to solve problems in mathematical and practical situations.	-1	

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)



<b>Statistics and Probability</b> <b>Investigate patterns of association in bivariate data.</b>			
Common Core State Standard (CCSS)	Nevada State Standard (NSS)	Change <sup>1</sup>	Comments
8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	5.6.3 Analyze the effect a change of graph type has on the interpretation of a set of data.  Interpret data and make predictions using circle graphs and scatter plots.	+2	
	5.8.1 Formulate questions and design a study that guides the collection of data.  Organize, display, and read data including box and whisker plots (with and without technology).	0	
8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.			
8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. <i>For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.</i>			
8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. <i>For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?</i>	5.8.1 Formulate questions and design a study that guides the collection of data.  Organize, display, and read data including box and whisker plots (with and without technology).		Extend work with categorical data in the NSS to creating tables of two variables, using relative frequencies as well as counts, and use to look for associations.

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)



Part II: The table below lists the Nevada State Standards (NSS) teachers are expected to continue to teach in Grade 8 in school year 2012–2013. In some cases, only part of the standard is to be maintained. These standards are still eligible to be assessed. Standards in **bold** indicate those found in Part I that link to the CCSS. Standards underlined indicate those that cannot be assessed on the state Criterion Reference Test (CRT). Additional clarification is provided in the comments.

Nevada State Standard (NSS)	Comments
<b>1.8.1</b> , 1.8.2, <b>1.8.3</b> , <b>1.8.5</b> , <b>1.8.7</b> 2.8.3, <b>2.8.4</b> , <b>2.8.5</b> , 2.8.6 3.8.3, 3.8.5 4.8.2, 4.8.3, <b>4.8.5</b> , 4.8.6, <b>4.8.7</b> , <u>4.8.8</u> , <u>4.8.9</u> <b>5.8.1</b> , 5.8.2, 5.8.3, 5.8.5, 5.8.6	Continue to teach the entire standard.
<b>2.8.2</b> (partial) Evaluate formulas and algebraic expressions using rational numbers (with and without technology). Solve <del>and graphically represent</del> equations and inequalities in one variable, including absolute value.	Continue to evaluate formulas and algebraic expressions.  Continue to <u>solve</u> equations and inequalities in one variable. Graphing inequalities is in the CCSS in Grade 7 and High School.
4.8.1 (partial) Find and use the sum of the measures of interior angles of <del>polygons</del> [triangles].	This standard is in the CCSS in Grade 8, but only for triangles.

Part III: The table below lists the Nevada State Standards (NSS) teachers are no longer expected to teach in Grade 8 in school year 2012–2013. In some cases, only part of a standard is to be deleted. Additional clarification is provided in the comments. Cells shaded gray indicate NSS eliminated in school year 2011–2012.

Nevada State Standard (NSS)	Comments
1.8.6 Use estimation strategies to determine the reasonableness of an answer in mathematical and practical situations.	While this is not a <i>content</i> standard under the CCSS, students <u>must</u> continue to use estimation as part of the <i>Standards for Mathematical Practice</i> .
1.8.8 Identify and apply the Identity property, Inverse property, and the absolute value of real numbers to solve problems.	This standard is in the CCSS in Grade 7.
2.8.1 Find the missing term in a numerical sequence or a pictorial representation of a sequence.	This standard is formally in the CCSS in High School, although it should be considered an application of standards involving linear functions, such as 8.F.3.

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., –1 indicates that the NSS was previously taught in the grade above.)



Part III continued:

Nevada State Standard (NSS)	Comments
2.8.2 (partial) <del>Solve and</del> [G]raphically represent equations and inequalities in one variable, including absolute value.	Continue to solve equations and inequalities in one variable. Graphing inequalities is in the CCSS in Grade 7 and High School.
3.8.1 Estimate and convert units of measure for mass and capacity within the same measurement system (customary and metric).	This standard is in the CCSS in Grade 5.
3.8.2 Demonstrate an understanding of precision, error, and tolerance when using appropriate measurement tools.	This topic is not present in the CCSS.
3.8.4 Calculate percents in monetary problems.	This standard is in the CCSS in Grade 7.
4.8.1 (partial) Find and use the sum of the measures of interior angles of polygons [with more than 3 sides].	This standard is in the CCSS in Grade 8, but only for triangles.
5.8.4 Find the number of combinations possible in mathematical and practical situations.  Distinguish between permutations and combinations.	This standard is in the CCSS in High School.

<sup>1</sup> Grade Level Change from current NSS to CCSS. (i.e., -1 indicates that the NSS was previously taught in the grade above.)