

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example,  $3^2 \times 3(-5) = 3(-3) = 1/(3^3) = 1/27$ . *Expressions and Equations - Work with radicals and integer exponents.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Evaluate expressions that have been simplified incorrectly using the properties of integer exponents. Identify the properties used incorrectly and how they were used incorrectly. Re-simplify expressions with detailed justifications using the properties of exponents correctly</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Know and apply the properties of integer exponents to generate equivalent numerical expressions</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> integer, exponent</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Recognize exponential form  <b><u>Learning Target 3:</u></b> Evaluate an expression in exponential form</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed. *Expressions and Equations - Understand the connections between proportional relationships, lines, and linear equations.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Represent proportional relationships using multiple representations, and solve problems and justify solutions with detailed explanations</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Graph proportional relationships, interpreting the unit rate as the slope of the graph</p> <p><b><u>Learning Target 2:</u></b> Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> unit rate, slope</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Determine unit rate</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.EE.7 Solve linear equations in one variable. *Expressions and Equations - Analyze and solve linear equations and pairs of simultaneous linear equations.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b>Learning Target 1:</b> Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law <math>V = IR</math> to highlight resistance <math>R</math> (MGSE9-12A.CED.4)</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b>Learning Target 1:</b> 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 <math>x = a</math>, <math>a = a</math>, or <math>a = b</math> results (where <math>a</math> and <math>b</math> are different numbers) (MGSE8.EE.7.a)</p> <p><b>Learning Target 2:</b> Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms (MGSE8.EE.7.b)</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b>Learning Target 1:</b> all real numbers, infinitely many solutions, no solution</p> <p><b>The student will perform basic processes:</b></p> <p><b>Learning Target 2:</b> Solve a two-step equation with one solution</p> <p><b>Learning Target 3:</b> Simplify expressions with rational number coefficients (fractions/decimals)</p> <p><b>Learning Target 4:</b> Simplify expressions by combining like terms</p> <p><b>Learning Target 5:</b> Simplify expressions needing the distributive property</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.EE.8 Analyze and solve pairs of simultaneous linear equations (systems of linear equations). *Expressions and Equations - Analyze and solve linear equations and pairs of simultaneous linear equations.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Determine the best method to use to solve a given system of equations, and justify your answer</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Solve real-world problems leading to two linear equations in two variables (MGSE8.EE.8.c)  <b><u>Learning Target 2:</u></b> Solve mathematical problems leading to two linear equations in two variables (MGSE8.EE.8.c)</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> system of equations, one solution, no solution, infinitely many solutions</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously (MGSE8.EE.8.a)  <b><u>Learning Target 3:</u></b> Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection (MGSE8.EE.8.b)</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). 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. *Functions - Define, evaluate, and compare functions.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b>Learning Target 1:</b> Analyze two scenarios that can be represented by functions and: depict each scenario in all representations (algebraically, graphically, numerically in tables and verbally); justify solutions with a detailed explanation using mathematical proof and showing evidence; use representations to make predictions for given inputs and outputs</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b>Learning Target 1:</b> Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). 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</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b>Learning Target 1:</b> rate of change, function</p> <p><b>The student will perform basic processes:</b></p> <p><b>Learning Target 2:</b> Plot points in a four-quadrant coordinate plane  <b>Learning Target 3:</b> Identify independent and dependent variables  <b>Learning Target 4:</b> Recognize characteristics of a proportional relationship</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.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. For example, the function  $A = s^2$  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. *Functions - Define, evaluate, and compare functions.***

	Proficiency Scale
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Match real-world situations (in verbal descriptions) to their appropriate graphs, classifying each scenario as linear or nonlinear with justification</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Interpret the equation <math>y = mx + b</math> as defining a linear function, whose graph is a straight line</p> <p><b><u>Learning Target 2:</u></b> Give examples of functions that are not linear. 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</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> non-linear, slope-intercept form, y-intercept</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Recognize and/or describe rules for sequences and number patterns</p> <p><b><u>Learning Target 3:</u></b> Recognize a function in various forms</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.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. *Functions - Use functions to model relationships between quantities.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Relate and apply modeling of linear relationships to real-world applications in new situations</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> 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</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> y-intercept/initial value</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Identify and calculate the rate of change (slope) and initial value (y-intercept) of a linear relationship given a data set</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.G.3 Describe the effect of dilations, translations, rotations and reflections on two-dimensional figures using coordinates. *Geometry - Understand congruence and similarity using physical models, transparencies, or geometry software.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another (MGSE9-12G.CO.5)</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Describe the effect of dilations on two-dimensional figures using coordinates  <b><u>Learning Target 2:</u></b> Describe the effect of translations on two-dimensional figures using coordinates  <b><u>Learning Target 3:</u></b> Describe the effect of rotations on two-dimensional figures using coordinates  <b><u>Learning Target 4:</u></b> Describe the effect of reflections on two-dimensional figures using coordinates</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> dilations, translations, rotations, reflections, transformation</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Find and position pairs of integers and other rational numbers on a coordinate plane (MGSE6.NS.6.c)</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success



## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the three angles appear to form a line, and give an argument in terms of transversals why this is so. *Geometry - Understand congruence and similarity using physical models, transparencies, or geometry software.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Use informal arguments to prove the measures of interior angles of a triangle sum to <math>180^\circ</math></p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Use informal arguments to establish facts about the angle sum and exterior angle of triangles  <b><u>Learning Target 2:</u></b> Use informal arguments to establish facts about the angles created when parallel lines are cut by a transversal  <b><u>Learning Target 3:</u></b> Use informal arguments to establish facts about the angle-angle criterion for similarity of triangles</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> transversal, linear pair, same side (consecutive) interior, same side (consecutive) exterior, alternate interior, alternate exterior, corresponding</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> Identify supplementary angles  <b><u>Learning Target 3:</u></b> Identify complementary angles  <b><u>Learning Target 4:</u></b> Identify vertical angles  <b><u>Learning Target 5:</u></b> Identify adjacent angles</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success

## Grade 8 Math Learning Map

**Prioritized Standard: MGSE8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. 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. *Statistics and Probability - Investigate patterns of association in bivariate data.***

Proficiency Scale	
4.0	<p><b>In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught. For example, the student will:</b></p> <p><b><u>Learning Target 1:</u></b> Use given data to graph a scatterplot, analyze data to make predictions for future events, and research additional points to add to the scatterplot and justify if they fit the trend</p>
3.5	In addition to score 3.0 performance, partial success at score 4.0 content
3.0	<p><b>The student will</b></p> <p><b><u>Learning Target 1:</u></b> Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. 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</p> <p><b>The student exhibits no major errors or omissions.</b></p>
2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0
2.0	<p><b>There are no major errors or omissions regarding the simpler details and processes.</b></p> <p><b>The student will recognize or recall specific vocabulary:</b></p> <p><b><u>Learning Target 1:</u></b> bivariate data, scatter plot, line of best fit</p> <p><b>The student will perform basic processes:</b></p> <p><b><u>Learning Target 2:</u></b> 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 (MGSE8.SP.1)</p> <p><b><u>Learning Target 3:</u></b> 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 (MGSE8.SP.2)</p> <p><b><u>Learning Target 4:</u></b> Identify the rate of change (slope) and the initial value (y-intercept) of a linear relationship between two quantities</p> <p><b>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</b></p>
1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
1.0	With help, partial success at score 2.0 and score 3.0
0.5	With help, partial success at score 2.0 content but not at score 3.0 content
0.0	Even with help, no success