Proficiency Scales

Mathematics
Grade 8
2020

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PROFICIENCY SCALES

Proficiency scales serve as a starting point for unit planning, creating assessments, delivering instruction, grading, and reporting progress, as well as making teaching visible to students and guiding their growth on the standards. Specifically, a proficiency scale is a continuum or learning progression that articulates distinct levels of knowledge and skills relative to specific standards. It shows teachers and students what proficiency looks like, what knowledge and skills students need to achieve proficiency, and how students might go beyond proficiency.

A proficiency scale is composed of a series of levels as follows:

Score 3.0—Heart of the proficiency scale; it defines the target content that teachers expect all students to know and be able to do. I CAN statements are provided for this level.

Score 2.0—Simpler content; it describes the foundational knowledge and skills that students will need to master before progressing to proficiency.

Score 4.0—Challenging content; it provides students the opportunity to go above and beyond expectations by applying their knowledge in new situations or demonstrating understanding beyond what the teacher teaches in class. A generic statement is provided for this level.

Scores 1.0 and 0.0—No specific content; 1.0 indicates that a student can demonstrate some knowledge or skill with help from the teacher, but not independently; 0.0 means that, even with help, a student cannot show any understanding. Generic statements are provided for these levels.

Half-point Scores—More precise measurement of knowledge and skills that is between two levels. Generic statements are provided for these levels.

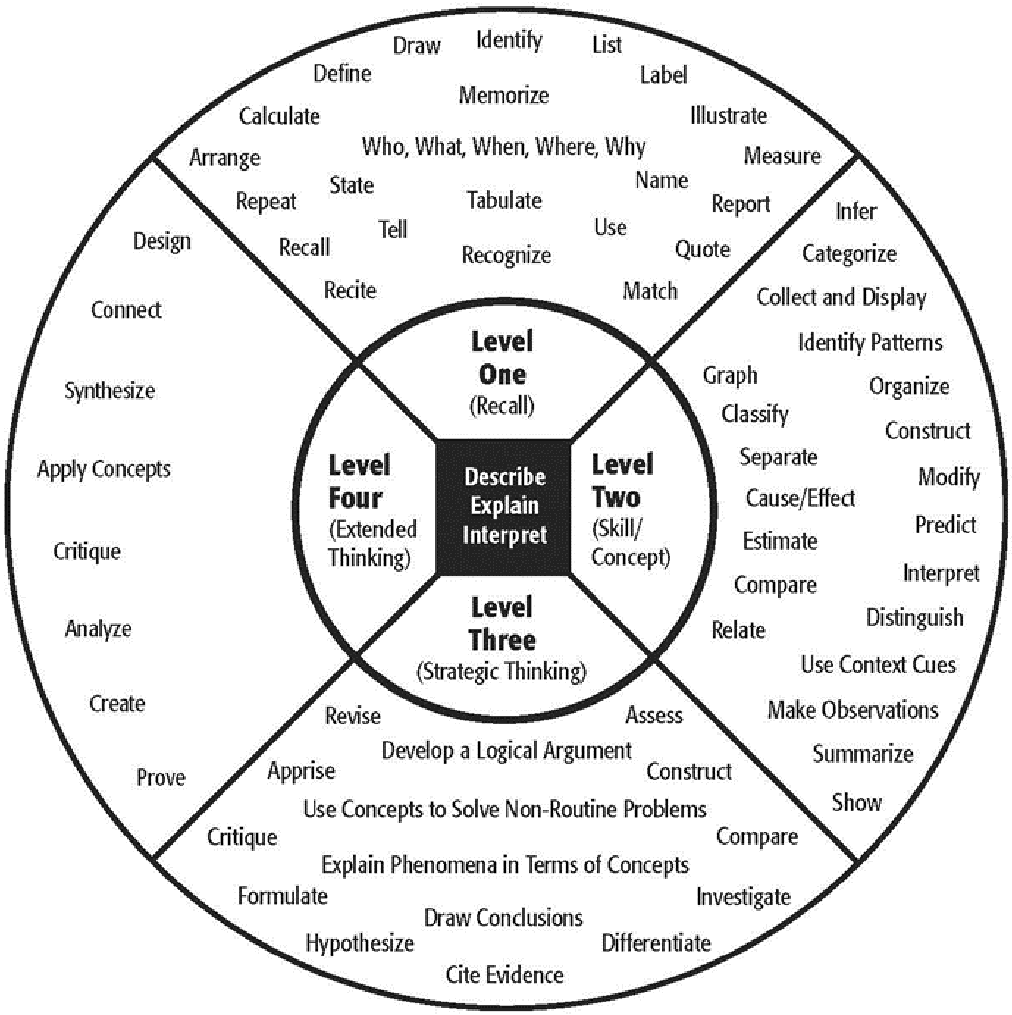
Proficiency scales become the centerpiece of communication and understanding in the classroom, as well as the common language for discussing learning between teacher and student.

The proficiency scales are organized according to the domains and strands in the NAD standards.

The cognitive rigor or complexity of the 3.0 learning targets has also been included, for it impacts the selection of instructional activities as well as assessment tasks. The Depth of Knowledge (DOK) model is generally used for this purpose, which is a taxonomy of four levels of cognitive demand. The levels are:

- **Level 1**—Recall
- **Level 2**—Skill/Concept
- **Level 3**—Strategic Thinking
- **Level 4**—Extended Thinking

Depth of Knowledge (DOK) Levels



Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting. Conduct basic mathematical calculations. Label locations on a map. Represent in words or diagrams a scientific concept or relationship. Perform routine procedures like measuring length or using punctuation marks correctly. Describe the features of a place or people.	Identify and summarize the major events in a narrative. Use context cues to identify the meaning of unfamiliar words. Solve routine multiple-step problems. Describe the cause/effect of a particular event. Identify patterns in events or behavior. Formulate a routine problem given data and conditions. Organize, represent and interpret data.	Support ideas with details and examples. Use voice appropriate to the purpose and audience. Identify research questions and design investigations for a scientific problem. Develop a scientific model for a complex situation. Determine the author's purpose and describe how it affects the interpretation of a reading selection. Apply a concept in other contexts.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/ solutions. Apply mathematical model to illuminate a problem or situation. Analyze and synthesize information from multiple sources. Describe and illustrate how common themes are found across texts from different cultures. Design a mathematical model to inform and solve a practical or abstract situation.

Webb, Norman L. and others. "Web Alignment Tool" 24 July 2005. Wisconsin Center of Educational Research. University of Wisconsin-Madison. 2 Feb. 2006. <http://www.wcer.wisc.edu/WAT/index.aspx>.

DISCIPLINARY TRANSFER GOALS

There are a small number of overarching, long-term transfer goals in each subject area. They are meant to be integrated within and across grade-level instruction. Below are the transfer goals for math.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

ESSENTIAL QUESTIONS AND BIG IDEAS for MATH DOMAINS

Numbers and Operations

Essential Question: How can we use God's gift of the number system to understand the world and all created things?

Big Idea: The use of numerical and algebraic expressions helps us solve real-world and mathematical problems as well as understand God's creation.

Operations and Algebraic Thinking

Essential Question: What do mathematical principles reveal about God's ordered universe?

Big Idea: The consistency of mathematical order of operations and principles demonstrates the orderliness and precision of God's creation and universe.

Measurement

Essential Question: How do the accuracy of measurements help us fathom God's creation?

Big Idea: Accurate measurements and conversions help to solve multi-step real-world problems and see the scope of God's creation.

Geometry

Essential Question: How does the study of geometrical principles help us to better understand God's creation?

Big Idea: The complexity of God's creation is revealed in the attributes and relationships of geometric objects and principles when applied to the real world.

Data Analysis, Statistics, and Probability

Essential Question: How can we collect and use information in a way that reflects God's orderly creation?

Big Idea: Information from God's vast creation can be measured, recorded, and displayed to assist in understanding and decision making.

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Subject: **Math**	Domain: **Numbers and Operations** Strand: **Rational/Irrational Numbers**	Grade: **8**

Standard: 8.NO.1 Informally understand and use number sense for irrational numbers (8.NS.1,2)		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: • Use rational approximations of irrational numbers to compare the size of irrational numbers and estimate the value of expressions *(e.g., by truncating the decimal expansion of √2, show that √2 is between 1 and 2 on a number line, then between 1.4 and 1.5, and explain how to continue on to get better approximations)* **DOK 3** **I can use rational approximations of irrational numbers to compare the size of irrational numbers.**	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will recognize or recall vocabulary such as: • *Approximation, compare, convert, decimal, estimate, expansion, expression, irrational number, nonrepeating, nonterminating, number line, rational, rational number, size, truncating, value* The student will perform basic processes, such as: • Explain that numbers that are not rational are called irrational • Explain that every number has a decimal expansion • Show that the decimal expansion for rational numbers repeats eventually *(e.g., 3/7 = 0.428571428571428571…)* • Convert a decimal expansion which repeats eventually into a rational number *(e.g., 0.5555555555 = 5/9)* • Locate irrational numbers (using rational approximations) on a number line • Recognize or recall examples of irrational numbers such as *π,* √2, and nonrepeating, nonterminating decimals	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content

Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**	Domain: **Operations and Algebraic Thinking** Strand: **Expressions/Equations/Inequalities**	Grade: **8**

Standard: 8.OAT.1 Work with radicals and integer exponents (8.EE.1,2,3,4)		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: • Evaluate square roots of small perfect squares and cube roots of small perfect cubes *(e.g., solve for r in the following equation: $r^2 = 81$)* **DOK 3** **I can evaluate the square root of a perfect square and the cube root of a perfect cube.** • 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 *(e.g., estimate the population of the United States as 3×10^8, and the population of the world as 7×10^9, and determine that the world population is more than 20 times larger)* **DOK 3** **I can use single digit numbers times integer powers of 10 to estimate large or small quantities.** • Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used *(e.g., write the answer to the following in both scientific and decimal notation: Jensen is building a snow fort. Each block in the fort weights about 1 kilogram. Jensen hopes to make about 40 blocks for the fort. If a snowflake weighs about 3×10^{-3} grams, approximately how many snowflakes will be in the fort?)* **DOK 3** **I can solve problems with numbers expressed in scientific and decimal notation.**	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will recognize or recall vocabulary such as: • *Compare, cube root, decimal, digit, equation, equivalent, estimate, evaluate, exponent, expression, integer, irrational, large, measurement, number, numerical, operation, perfect cube, perfect square, positive, power of 10, quantity, rational number, reasoning, scientific notation, small, solution, square root, symbol, unit* The student will perform basic processes, such as:	

	• Know and apply the properties of integer exponents to generate equivalent numerical expressions *(e.g., $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$)* • 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 *(e.g., evaluate the expression $\sqrt{196}$)* • Recognize that $\sqrt{2}$ is irrational • Use scientific notation for measurements of very large and very small quantities *(e.g., write the following into scientific notation: the distance between the sun and the Earth is 93,000,000 miles; the distance between the sun and Neptune is 2,795,000,000 miles)* • Choose units of appropriate size for measurements of very large or very small quantities *(e.g., use millimeters per year for seafloor spreading)*	
Re	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**	Domain: **Operations and Algebraic Thinking** Strand: **Expressions/Equations/Inequalities**		Grade: **8**
Standard: 8.OAT.2 Understand and graph the connections between proportional relationships, lines, slope, and linear equations (8.EE.5,6)			
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught		
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content	
Score 3.0	The student will: • 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 *(e.g., construct two triangles between two points on a line in the coordinate plane and compare the sides to understand that the slope (ratio of rise to run) is the same between any two points on a line)* **DOK 3** **I can use similar triangles to explain why the slope m is the same between two points on a non-vertical line in a coordinate plane.** • Derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intersecting the vertical axis at b **DOK 3** **I can explain the equations y = mx and y = mx + b.**		
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content	
Score 2.0	The student will recognize or recall vocabulary such as: • *Axis, compare, coordinate plane, equation, graph, interpret, intersect, line, origin, point, proportional relationship, similar, slope, table, triangle, unit rate, vertical* The student will perform basic processes, such as: • Graph proportional relationships, interpreting the unit rate as the slope of the graph *(e.g., graph the relationship between distance and time for a vehicle traveling at a constant speed of 30 miles per hour)* • Compare two different proportional relationships represented in different ways *(e.g., compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed)*		
Re	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content	
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content		

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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<table>
<tr><td colspan="3">Subject: Math Domain: Operations and Algebraic Thinking Strand: Expressions/Equations/Inequalities Grade: 8</td></tr>
<tr><td colspan="3">Standard: 8.OAT.3 <u>Analyze and solve linear equations</u> and pairs of simultaneous linear equations (8.EE.7)</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:
Solve linear equations in one variable with rational number coefficients where there is one solution, infinitely many solutions, or no solution, including equations whose solutions require expanding expressions (e.g., 8(x + 2) = 2x + 16, 4x + 16 = 12(8x + 16), 1.8y – 16.3 = -1.9y + 13.3) DOK 3
I can solve linear equations in one variable with rational number coefficients.</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">The student will recognize or recall vocabulary such as:
Coefficient, distributive property, equation, equivalent, example, expanding, expression, infinite, integer, like, linear, rational number, solution, term, variable
The student will perform basic processes, such as:
Solve linear equations in one variable with integer coefficients where there is one solution (e.g., 2x – 1 = 5)
Recognize examples of linear equations in one variable with rational number coefficients where there is one solution, infinitely many solutions, or no solutions (e.g., given a series of equations, determine if there is one solution, infinitely many solutions, or no solution to each equation, by transforming the given equation into simpler forms until an equivalent equation of the form x = a, a = a, or a = b results)
Use the distributive property and collect like terms when solving linear equations (e.g., when given the equation 7y + 2(y – 5) + y, simply the expression by combining like terms before solving)</td></tr>
<tr><td>Re</td><td>Score 1.5</td><td>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</td></tr>
<tr><td>Score 1.0</td><td colspan="2">With help, partial success at score 2.0 content and score 3.0 content</td></tr>
</table>

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

Subject: **Math**	Domain: **Operations and Algebraic Thinking** Strand: **Expressions/Equations/Inequalities**	Grade: **8**
Standard: 8.OAT.3 Analyze and solve linear equations and pairs of simultaneous linear equations (8.EE.8)		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: • Solve systems of two linear equations with rational solutions in two variables *(e.g., y = 2x – 5 and y = 1/2x -5)* **DOK 3** **I can solve pairs of simultaneous linear equations in two variables.** • Solve real-world and mathematical problems leading to two linear equations in two variables *(e.g., given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair)* **DOK 3** **I can solve problems leading to two linear equations in two variables.**	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will recognize or recall vocabulary such as: • *Algebraic, equation, estimate, graph, infinite, integer, intersection, linear, mathematical, point, rational, real world, simultaneously, solution, system, variable* The student will perform basic processes, such as: • Solve systems of two linear equations with integer solutions in two variables algebraically *(e.g., solve the system 10x – 3y = 5 and -2x – 4y = 7 algebraically)* • Estimate the solutions of systems of linear equations by graphing *(e.g., estimate the solution for the system 10x – 3y = 5 and -2x – 4y = 7 by graphing)* • Explain 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 • Explain that systems of linear equations may have one, infinitely many, or no solutions	
Re	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content

Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

Subject: **Math**	Domain: **Operations and Algebraic Thinking** Strand: **Functions**	Grade: **8**

Standard: 8.OAT.4 Define, evaluate, compare, and use functions to model relationships between quantities (8.F.1,2,3)		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: • Compare properties of two functions represented in different ways (algebraically, numerically in tables, graphically, or by verbal description) *(e.g., 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)* **DOK 3** **I can compare the properties of two functions that are represented differently.**	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will recognize or recall vocabulary such as: • *Algebraic, compare, equation, example, expression, function, graphic, input, interpret, linear, numeric, ordered pair, output, property, represent, table, verbal* The student will perform basic processes, such as: • Explain 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 *(e.g., names are used as inputs and ages are used as outputs; each input matches exactly with one output)* • 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 *(e.g., 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)*	
Re	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**	Domain: **Operations and Algebraic Thinking** Strand: **Expressions/Equations/Inequalities**		Grade: **8**
Standard: 8.OAT.4 Define, evaluate, compare, and use functions to model relationships between quantities (8.F.4,5)			
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught		
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content	
Score 3.0	The student will: • Determine and interpret the rate of change and initial value of a function from a description of a relationship or from two (*x, y*) values, including reading these from a table or from a graph *(e.g., given the amount of money in dollars a mailman gets paid (p) to deliver mail to houses (h) is modeled by the following function: p = 4h + 125, determine the rate of change and initial value)* **DOK 3** **I can determine and interpret the rate of change and initial value of a function.** • Describe qualitatively the functional relationship between two quantities by analyzing a graph *(e.g., where the function is increasing or decreasing, linear or nonlinear)* **DOK 3** **I can describe the functional relationship between two quantities by analyzing a graph.**		
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content	
Score 2.0	The student will recognize or recall vocabulary such as: • *Analyze, decrease, function, functional relationship, graph, increase, initial, linear, model, nonlinear, qualitative, quantity, rate of change, relationship, sketch, value* The student will perform basic processes, such as: • Construct a function to model a linear relationship between two quantities *(e.g., when given that an energy company bills electricity at a rate of $0.12 per kilowatt hour, and when given that each monthly bill includes a flat-rate service charge of $23, write a function describing the total monthly electric bill as a function of electricity usage)* • Sketch a graph that exhibits the qualitative features of a function that has been described verbally *(e.g., Jack borrows some money from his dad. Each week he pays his dad back the same amount until the debt is paid in full. Graph the amount of money Jack owes his dad as a function of time.)*		

	• Explain rate of change and initial value *(e.g., Rate of change is the slope of a line on a graph, the coefficient in the equation y = mx + b, and the unit rate of a table of values. Initial value is the y-intercept of a line on a graph, the constant term in the equation y = mx + b, and the y-value corresponding to x = 0.)*	
Re	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

Subject: **Math**	Domain: **Measurement** Strand: **Mathematical Precision**	Grade: **8**
Standard: 8.M.1 Use appropriate significant digits in calculations		
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: • Use appropriate significant digits in calculations *(e.g., The following are placed in a beaker weighing 39.457 g: 2.689 g of NaCl, 1.26 g of sand, and 5.0 g water. What is the final mass of the beaker?)* **DOK 3** **I can use significant digits in solving problems.**	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will recognize or recall vocabulary such as: • *Decimal, numeral, placeholder, point, relative size, significant digit, value* The student will perform basic processes, such as: • Explain significant digits *(e.g., digits which have meaning or contribute to the value of a number: All non-zero digits are significant. Any zeros between significant digits are also significant. Trailing zeros to the right of a decimal point are significant.)* • Count the number of significant digits in numbers *(e.g., 3.14159 has six significant digits; all the numerals ("digits") give us useful information. 0.00035 has two significant digits; only the 3 and 5 tell us something. The other zeroes are placeholders, only providing information about relative size.)* • Explain that if you are adding or subtracting, the answer has the same number of decimal places as that of the least given. If you are multiplying or dividing, the answer has the same number of significant figures as that of the least given.	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

Subject: **Math**	Domain: **Geometry** Strand: **Figures**		Grade: **8**
Standard: 8.NO.1 Understand congruence and similarity using various mediums including geometric software (8.G.1,3)			
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught		
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content	
Score 3.0	The student will: • Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates *(e.g., after rotations, reflections, and translations, figures still have the same size, area, angles, and line lengths; after dilations, figures are the same shape, but a different size)* **DOK 3** **I can describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.**		
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content	
Score 2.0	The student will recognize or recall vocabulary such as: • *Angle, coordinate, dilation, experimental, figure, line, line segment, parallel line, plane, property, reflection, rotation, transformation, translation, two-dimensional, verify* The student will perform basic processes, such as: • Explain dilations, rotations, reflections, and translations *(e.g., a dilation is a transformation that produces an image that is the same shape as the original but is a different size, a rotation turns a figure around a point, a reflection flips a figure over a line to create a mirror image, a translation slides a figure to a different location)* • Verify experimentally the properties of rotations, reflections, and translations *(e.g., given a coordinate plane with lines, line segments, angles, or parallel lines, perform rotations, reflections, or translations)*		
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content	
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content		

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**		Domain: **Geometry** Strand: **Figures**	Grade: **8**
Standard: 8.NO.1 Understand congruence and similarity using various mediums including geometric software (8.G.2,4)			
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught		
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content	
Score 3.0	The student will: • Describe a sequence of transformations that exhibits the similarity between two similar two-dimensional figures *(e.g., given two similar figures on the coordinate plane, identify the transformations that show that figure 1 is similar to figure 2)* **DOK 3** **I can describe a sequence of transformations to show that two figures are similar.**		
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content	
Score 2.0	The student will recognize or recall vocabulary such as: • Congruence, congruent, coordinate plane, dilation, exhibit, figure, reflection, rotation, sequence, similar, similarity, transformation, translation, two-dimensional The student will perform basic processes, such as: • Explain that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations *(e.g., figures have the same shape and size)* • Describe a sequence of transformations that exhibits the congruence between two congruent figures *(e.g., given two congruent figures on the coordinate plane, identify the transformations that show that figure 1 is congruent with figure 2)* • Explain that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations *(e.g., figures have the same shape, but not the same size)*		
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content	
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content		

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**	Domain: **Geometry** Strand: **Figures**	Grade: **8**
Standard: 8.NO.1 Understand congruence and similarity using various mediums including geometric software (8.G.5)		

Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught	
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content
Score 3.0	The student will: • Use informal arguments to establish facts about the angle sum and exterior angles of triangles, about the angles created when parallel lines are cut by a transversal, and about the angle-angle criterion for similarity of triangles *(e.g., arrange three copies of the same triangle so that the sum of the three angles appear to form a line, and give an argument in terms of transversals why this is so)* **DOK 3** **I can informally prove facts about angles.**	
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content
Score 2.0	The student will recognize or recall vocabulary such as: • Alternate, angle, congruent, corresponding, criterion, degree, interior, exterior, line, parallel, similar, similarity, transversal, triangle The student will perform basic processes, such as: • Recognize or recall facts about angle sum and exterior angles of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles *(e.g., sum of a triangle's interior angles is 180 degrees, sum of a triangle's exterior angles is 360 degrees; an exterior angle of a triangle will be equal to the sum of its opposite interior angles; the corresponding angles and alternate interior angles of parallel lines crossed by a transversal are congruent; and triangles with two angle measures in common are similar triangles)*	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	

	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**		Domain: **Geometry** Strand: **Figures**	Grade: **8**
Standard: 8.NO.2 Understand and apply the Pythagorean Theorem (8.G.6,7,8)			
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught		
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content	
Score 3.0	The student will: • Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in three dimensions *(e.g., when given the width and face measurements of a right square pyramid, calculate the height of the pyramid)* **DOK 3** **I can apply the Pythagorean Theorem to find an unknown side length of a right triangle.** • Apply the Pythagorean Theorem to find the distance between two points in a coordinate system *(e.g., use the Pythagorean Theorem to calculate the distance between the points (-1,-3) and (5,5) on the coordinate plane)* **DOK 3** **I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system.**		
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content	
Score 2.0	The student will recognize or recall vocabulary such as: • *Converse, coordinate plane, coordinate system, dimension, distance, face, height, hypotenuse, leg, length, mathematical, measurement, point, proof, Pythagorean Theorem, real-world, right square pyramid, right triangle, side, square, triangle, unknown, width* The student will perform basic processes, such as: • Explain a proof of the Pythagorean Theorem *(e.g., using a model of a right triangle, show that the square of the hypotenuse is equal to the sum of the squares of the other two sides—$a^2 + b^2 = c^2$)* • Explain the converse of a proof of the Pythagorean Theorem *(e.g., given all the side lengths of a triangle, show that if $a^2 + b^2 = c^2$ in a triangle with c the longest side, then a triangle is a right triangle)* • Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two dimensions *(e.g., when given the hypotenuse measurement of a right triangle, find the lengths of*		

		the legs)
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	

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Subject: **Math**	Domain: **Geometry** Strand: **Volume**		Grade: **8**
Standard: 8.NO.3 Solve real-world and mathematical problems involving volume of cylinders, comes, and spheres (8.G.9)			
Score 4.0	In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught		
	Score 3.5	In addition to score 3.0 performance, partial success at score 4.0 content	
Score 3.0	The student will: • Use the formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical problems *(e.g., calculate the volume of an ice cream cone when given the radius of its top and its height; calculate how much soda is contained within a soda can when given the radius of its base and its height; calculate how much water a snow globe will hold when given the radius of the globe)* **DOK 3** **I can solve problems involving the volumes of cones, cylinders, and spheres.**		
	Score 2.5	No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content	
Score 2.0	The student will recognize or recall vocabulary such as: • *Calculate, cone, cube, cylinder, formula, height, mathematical, measurement, radius, real world, shape, solid, sphere, top, unit, volume* The student will perform basic processes, such as: • Understand volume as a measurement of unit cubes *(e.g., if a solid shape is made using unit cubes, the volume of the shape is equal to the number of unit cubes that make up the shape)* • Recognize or recall the formulas for the volumes of cones, spheres, and cylinders *(e.g., cones—$1/3\pi r^2h$; spheres—$4/3\pi r^3$; cylinders—πr^2h)*		
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content	
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content		
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content	

Score 0.0	Even with help, no success

<table>
<tr><td colspan="3">Subject: Math   Domain: Data Analysis, Statistics, and Probability
Strand: Statistics and Probability   Grade: 8</td></tr>
<tr><td colspan="3">Standard: 8.DSP.1 Investigate patterns of association in bivariate data (8.SP.1,2,3,4)</td></tr>
<tr><td>Score 4.0</td><td colspan="2">In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught</td></tr>
<tr><td></td><td>Score 3.5</td><td>In addition to score 3.0 performance, partial success at score 4.0 content</td></tr>
<tr><td>Score 3.0</td><td colspan="2">The student will:
Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept (e.g., 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) DOK 3
I can use the equation of a linear model of bivariate measurement data to solve problems.
Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects; use relative frequencies calculated from rows or columns to describe possible association between the two variables (e.g., 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?) DOK 3
I can construct and interpret a two-way table that summarizes bivariate categorical data.</td></tr>
<tr><td></td><td>Score 2.5</td><td>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</td></tr>
<tr><td>Score 2.0</td><td colspan="2">The student will recognize or recall vocabulary such as:
Association, bivariate, category, clustering, construct, data, equation, frequency, graph, intercept, interpret, investigate, line, linear, linear model, measurement, nonlinear, outlier, pattern, point, quantitative, quantity, relationship, relative frequency, scatter plot, slope, two-way table, variable
The student will perform basic processes, such as:
Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities (e.g., when given a set of bivariate measurement data, graph the data using a scatter plot; describe patterns such as clustering, outliers, positive or negative association, linear</td></tr>
</table>

	association, and nonlinear association) • Use straight lines to informally model and assess relationships between two quantitative variables *(e.g., 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)* • Explain that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table	
	Score 1.5	Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content
Score 1.0	With help, partial success at score 2.0 content and score 3.0 content	
	Score 0.5	With help, partial success at score 2.0 content but not at score 3.0 content
Score 0.0	Even with help, no success	