



## Proficiency Scale Grade 8

**Domain: Standards for Mathematical Content**

**Strand: The Number System (NS)**

**Benchmark Code: 8.SMC.NS.1**

**Standard: Know that there are numbers that are not rational, and approximate them by rational numbers. (DOK 2)**

<b>Score 4.0</b>	<p><b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b>                  Examples include, but are not limited to:</p> <ul style="list-style-type: none"> <li>● Solve real problems involving rational and irrational numbers.</li> </ul>	
	<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<p><b>Target goals:</b></p> <ul style="list-style-type: none"> <li>● <b>Illustrate that numbers that are not rational are irrational.</b></li> <li>● <b>Illustrate that every number has a decimal expansion.</b></li> <li>● <b>Convert a decimal expansion which repeats eventually into a rational number.</b></li> </ul>	
	<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<p><b>Simpler goals:</b></p> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                         <ul style="list-style-type: none"> <li>○ rational, irrational, number line.</li> </ul> </li> <li>● Locate rational approximations of irrational numbers on a number line diagram.</li> <li>● Estimate and compare the value of expressions by using rational approximations of irrational numbers.</li> </ul>	
	<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>	
	<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>	



**Domain: Standards for Mathematical Content**

**Strand: Expressions and Equations (EE)**

**Benchmark Code: 8.SMC.EE.1**

**Standard: Work with radicals and integer exponents.(DOK 2)**

<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>● Apply radicals and integer exponents to real world situations.</li> </ul>	
	<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>● Apply the properties of integer exponents to generate equivalent numerical expressions.</li> <li>● Evaluate square roots and cube roots of perfect squares and perfect cubes respectively.</li> <li>● Perform operations with numbers expressed in scientific form.</li> <li>● Interpret technology generated numbers that have been expressed in scientific form.</li> </ul>	
	<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals</b> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as: <ul style="list-style-type: none"> <li>○ radical, integer, exponent, square root, cube root, scientific notation.</li> </ul> </li> <li>● Estimate and compare large or small quantities using numbers expressed in the form of a single digit times a whole number power of 10.</li> <li>● Use square roots and cube roots to represent solutions of the form <math>x^2 = p</math> and <math>x^3 = p</math> respectively, where <math>p</math> is a positive rational number.</li> <li>● Choose units for appropriate size measurements of large quantities using scientific notation.</li> </ul>	
	<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>	
	<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>	



## Proficiency Scale Grade 8

**Domain: Standards for Mathematical Content**

**Strand: Expressions and Equations (EE)**

**Benchmark Code: 8.SMC.EE.2**

**Standard: Understand the connections between proportional relationships, lines, and linear equations.(DOK 2)**

<b>Score 4.0</b>	<p><b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b>                  Examples include, but are not limited to:</p> <ul style="list-style-type: none"> <li>● Apply proportional relationships to real world situations.</li> </ul>	
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>	
<b>Score 3.0</b>	<p><b>Target goals:</b></p> <ul style="list-style-type: none"> <li>● Compare two different relationships represented in different ways.</li> <li>● Use two triangles to illustrate that the slope <math>m</math> is the same between any two distinct points on a non-vertical line in the coordinate plane.</li> <li>● Derive the equation of a line through the origin (<math>y = mx</math>) and the equation of a line intercepting the vertical axis at <math>b</math> (<math>y = mx + b</math>).</li> </ul>	
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>	
<b>Score 2.0</b>	<p><b>Simpler goals:</b></p> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                         <ul style="list-style-type: none"> <li>○ slope, proportional, vertical, coordinate plane.</li> </ul> </li> <li>● Interpret the unit rate as the slope of a graph by showing a proportional relationship.</li> <li>● Graph a proportional relationship.</li> </ul>	
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>	
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>	
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>	
<b>Score 0.0</b>	<b>Even with help, no success</b>	



**Domain: Standards for Mathematical Content**

**Strand: Expressions and Equations (EE)**

**Benchmark Code: 8.SMC.EE.3**

**Standard: Analyze and solve linear equations and pairs of simultaneous linear equations.(DOK 2)**

<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>● Solve real life situations involving a system of two or more linear equations in two variables.</li> </ul>	
	<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>● Determine solutions of two linear equations by graphing the equations.</li> <li>● Illustrate how solutions to a system of two linear equations in two variables correspond to points of intersection of their graph.</li> <li>● Solve systems of two linear equations in two variables algebraically.</li> <li>● Solve real world and mathematical problems leading to two linear equations in two variables.</li> </ul>	
	<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals:</b> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                             <ul style="list-style-type: none"> <li>○ coordinate plane, system, intersection, unique solution, infinite solutions, no solutions.</li> </ul> </li> <li>● Create linear equations in one variable with one solution, infinitely many solutions, and no solutions.</li> <li>● Solve linear equations with rational number coefficients.</li> </ul>	
	<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>	
	<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>	

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<b>Domain: Standards for Mathematical Content</b> <b>Strand: Functions (F)</b> <b>Benchmark Code: 8.SMC.F.1</b> <b>Standard: Define, evaluate, and compare functions. (DOK 2)</b>	
<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>• Apply functions involving linear and nonlinear to real life situations.</li> </ul>
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>• Compare the properties of two functions each represents in a different way.</li> <li>• Interpret the equation <math>y = mx + b</math> as defining linear function, whose graph is a straight line.</li> <li>• Construct an example of functions that are not linear.</li> </ul>
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals:</b> <ul style="list-style-type: none"> <li>• Recognize or recall specific vocabulary, such as:                             <ul style="list-style-type: none"> <li>◦ function, evaluate, input, output.</li> </ul> </li> <li>• Recognize that a function is a rule that assigns to each input exactly one output.</li> <li>• Relate the graph of a function to the set of ordered pairs consisting of an input and the corresponding output.</li> </ul>
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>



<b>Domain: Standards for Mathematical Content</b> <b>Strand: Functions (F)</b> <b>Benchmark Code: 8.SMC.F.2</b> <b>Standard: Use functions to model relationships between quantities. (DOK 2)</b>	
<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>● Apply the function model to evaluate real world situations.</li> </ul>
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>● <b>Construct a function to model a linear relationship between two quantities.</b></li> <li>● <b>Interpret the rate of change and initial value of a linear function in terms of the situation it models.</b></li> <li>● <b>Interpret the rate of change and initial value of a linear function in terms of its graph.</b></li> <li>● <b>Interpret the rate of change and initial value of a linear function in terms of a table of values.</b></li> </ul>
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals:</b> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                             <ul style="list-style-type: none"> <li>○ rate of change, function, value.</li> </ul> </li> <li>● Determine the rate of change and initial value of the function from a description of a relationship.</li> <li>● Determine the rate of change and initial value of the function from two (x, y) values.</li> <li>● Graph the qualitative features of a function that has been described verbally.</li> </ul>
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>



<b>Domain: Standards for Mathematical Content</b> <b>Strand: Geometry (G)</b> <b>Benchmark Code: 8.SMC.G.1</b> <b>Standard: Understand congruence and similarity using physical models, transparencies, or geometry software. (DOK 3)</b>	
<b>Score 4.0</b>	<p><b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b></p> <p>Examples include, but are not limited to:</p> <ul style="list-style-type: none"> <li>● Create two congruent figures using rotations, reflections, translations, and/or dilations.</li> <li>● Compare congruent figures and similar figures using rotations, reflections, translations, and/or dilations.</li> </ul>
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<p><b>Target goals:</b></p> <ul style="list-style-type: none"> <li>● <b>Describe a sequence that exhibits the congruence between two congruent figures.</b></li> <li>● <b>Explain the following effect on two-dimensional figures using coordinates:</b> <ul style="list-style-type: none"> <li>○ <b>Dilations.</b></li> <li>○ <b>Translations.</b></li> <li>○ <b>Rotations.</b></li> <li>○ <b>Reflections.</b></li> </ul> </li> </ul>
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<p><b>Simpler goals:</b></p> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as: <ul style="list-style-type: none"> <li>○ rotation, reflection, translation, dilation, congruence, line, parallel lines, angle, line segment.</li> </ul> </li> <li>● Manipulate the properties of rotations, reflections, and translations when: <ul style="list-style-type: none"> <li>○ lines are taken to lines.</li> <li>○ line segments are taken to line segments of the same length.</li> <li>○ angles are taken to angles of the same measure.</li> <li>○ parallel lines are taken to parallel line.</li> </ul> </li> </ul>
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>

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<b>Domain: Standards for Mathematical Content</b> <b>Strand: Geometry (G)</b> <b>Benchmark Code: 8.SMC.G.1</b> <b>Standard: Understand congruence &amp; similarity using physical models, transparencies, or geometry software.</b> <b>(DOK 3)</b>	
<b>Score 4.0</b>	<p><b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b></p> <p>Examples include, but are not limited to:</p> <ul style="list-style-type: none"> <li>● Create two similar figures using rotations, reflections, translations, and/or dilations.</li> <li>● Compare congruent figures and similar figures using rotations, reflections, translations, and/or dilations.</li> </ul>
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<p><b>Target goals:</b></p> <ul style="list-style-type: none"> <li>● <b>Relate one two-dimensional figure as similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, or dilations.</b></li> <li>● <b>Describe a sequence that exhibits the similarity between two similar two-dimensional figures by stating informal arguments about the Angle-Angle Similarity.</b></li> </ul>
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<p><b>Simpler goals:</b></p> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                             <ul style="list-style-type: none"> <li>○ rotation, reflection, translation, dilation, similar, transversal, parallel lines.</li> </ul> </li> <li>● Recognize the Angle Sum Theorem, Exterior Angle Theorem, and angle-angle similarity.</li> <li>● State informal arguments to establish facts about:                             <ul style="list-style-type: none"> <li>○ the Angle Sum Theorem.</li> <li>○ the Exterior Angle Theorem.</li> <li>○ angles cut by a transversal</li> </ul> </li> </ul>
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>





<b>Domain: Standards for Mathematical Content</b> <b>Strand: Geometry (G)</b> <b>Benchmark Code: 8.SMC.G.2</b> <b>Standard: Understand and apply the Pythagorean Theorem. (DOK 3)</b>	
<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>● Solve real-world problems involving right triangles by using the Pythagorean Theorem.</li> </ul>
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>● Explain a proof of the Pythagorean Theorem.</li> <li>● Explain a proof of the converse of the Pythagorean Theorem.</li> <li>● Solve real-world and mathematical problems in two dimensions using the Pythagorean Theorem to determine unknown side lengths in right triangles.</li> <li>● Solve real-world and mathematical problems in three dimensions using the Pythagorean Theorem to determine unknown side lengths in right triangles.</li> <li>● Find the distance between two points in a coordinate system using the Pythagorean Theorem.</li> </ul>
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals:</b> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                             <ul style="list-style-type: none"> <li>○ Pythagorean Theorem, proof, converse, dimension.</li> </ul> </li> <li>● Recognize or recall the formula for Pythagorean Theorem.</li> <li>● Solve multi-step equations.</li> <li>● Calculate squares and square roots.</li> <li>● Graph coordinates in a coordinate plane.</li> </ul>
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>



**Domain: Standards for Mathematical Content**

**Strand: Geometry (G)**

**Benchmark Code: 8.SMC.G.3**

**Standard: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. (DOK 2)**

<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>● Explain how two different-sized cylinders can have the same volume.</li> <li>● Apply understandings of cylinders, cones, and spheres to real-world objects.</li> </ul>	
	<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>● <b>Solve real-world and mathematical problems using the following volume formulas:</b> <ul style="list-style-type: none"> <li>○ <b>Cones.</b></li> <li>○ <b>Cylinders.</b></li> <li>○ <b>Spheres.</b></li> </ul> </li> </ul>	
	<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals</b> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                     <ul style="list-style-type: none"> <li>○ cone, cylinder, sphere, volume.</li> </ul> </li> <li>● Recognize or recall the formulas for volume of cones, volume of cylinders, and volume of spheres.</li> </ul>	
	<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>	
	<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>	

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<b>Domain: Standards for Mathematical Content</b> <b>Strand: Statistics and Probability (SP)</b> <b>Benchmark Code: 8.SMC.SP.1</b> <b>Standard: Investigate patterns of association in bivariate data. (DOK 3)</b>	
<b>Score 4.0</b>	<b>In addition to a score 3.0 performance, the student demonstrates in-depth inferences and/or application of knowledge.</b> Examples include, but are not limited to: <ul style="list-style-type: none"> <li>● Create models to show correlation two sets of bivariate data.</li> </ul>
<i>Score 3.5</i>	<i>In addition to a score 3.0 performance, partial success at score 4.0 content</i>
<b>Score 3.0</b>	<b>Target goals:</b> <ul style="list-style-type: none"> <li>● Analyze patterns of association between two quantities on a scatter plot of bivariate measurement data.</li> <li>● Analyze patterns of association of categorical data displayed in a two-way frequency and relative frequency table.</li> <li>● Analyze summary data from a two-way frequency table to describe the association between two category.</li> <li>● Evaluate the proximity of data points to a line on a scatter plot to determine the linear association.</li> <li>● Assess the model fit to a line on a scatter plot by evaluating the closeness of the data points to a line.</li> </ul>
<i>Score 2.5</i>	<i>No major errors or omissions regarding score 2.0 content and partial success at score 3.0 content</i>
<b>Score 2.0</b>	<b>Simpler goals:</b> <ul style="list-style-type: none"> <li>● Recognize or recall specific vocabulary, such as:                             <ul style="list-style-type: none"> <li>○ scatter plots, bivariate data, patterns, correlation, line of best fit.</li> </ul> </li> <li>● Construct scatter plots for bivariate measurement data.</li> <li>● Construct a two-way table summarizing data on two categorical variables collected from the same subjects.</li> </ul>
<i>Score 1.5</i>	<i>Partial success at score 2.0 content and major errors or omissions regarding score 3.0 content</i>
<b>Score 1.0</b>	<b>With help, partial success at score 2.0 content and score 3.0 content</b>
<i>Score 0.5</i>	<i>With help, partial success at score 2.0 content but not at score 3.0 content</i>
<b>Score 0.0</b>	<b>Even with help, no success</b>