

# GRADES 6-8 MATHEMATICS

## Performance Level Descriptors

Grade 6 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Multiplying and Dividing with Fractions: 6.NS.1-2			
Solves word problems involving division of fractions by fractions.	Divides fractions with unlike denominators and solves word problems with prompting embedded within the problem.	Divides fractions with common denominators and solves word problems with prompting embedded within the problem.	Divides fractions with common denominators.
Ratios: 6.RP.1, 6.RP.2, 6.RP.3a, 6.RP.3b, 6.RP.3c-1, 6.RP.3c-2, 6.RP.3d			
Uses ratio and rate reasoning to solve real-world and mathematical problems, including ratio, unit rate, percent and unit conversion problems.	Uses ratio and rate reasoning to solve real-world and mathematical problems, including ratio, unit rate, percent and unit conversion problems using a limited variety of representations and strategies.	Uses ratio and rate reasoning to solve mathematical problems, including ratio, unit rate, percent and unit conversion problems using a limited variety of representations and strategies.	Solves problems including ratio, unit rate, percent and unit conversion problems using a limited variety of representations and strategies.
Uses and connects a variety of representations and strategies to solve these problems.			
Finds missing values in tables and plots values on the coordinate plane.	Finds missing values in tables and locates and plots values on the coordinate plane.	Finds missing values in tables and locates or plots values on the coordinate plane.	
Rational Numbers: 6.NS.5, 6.NS.6a, 6.NS.6b-1, 6.NS.6b-2, 6.NS.6c-1, 6.NS.6c-2, 6.NS.7a, 6.NS.7b, 6.NS.7c-1, 6.NS.7c-2, 6.NS.7d, 6.NS.8			
Understands that positive and negative numbers describe mathematical or real-world quantities which have opposite values or directions and can be represented on a number line and compared with or without the use of a number line.	Understands that positive and negative numbers describe mathematical or real-world quantities which have opposite values or directions and can be represented on a number line and compared with or without the use of a number line.	Understands that positive and negative numbers describe mathematical or real-world quantities which have opposite values or directions and can be represented on a number line.	Understands that positive and negative numbers describe mathematical or real-world quantities which have opposite values or directions and can be represented on a number line.
Understands and interprets the absolute value of a rational number.	Understands the absolute value of a rational number.	Determines the absolute value of a rational number.	Determines the absolute value of a rational number.

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 6 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Plots ordered pairs on a coordinate plane to solve real-world and mathematical problems.	Plots ordered pairs on a coordinate plane to solve real-world and mathematical problems.	Locates or plots ordered pairs on a coordinate plane to solve mathematical problems.	
Understands (or recognizes) that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.			
Distinguishes comparisons of absolute value from statements about order.			
Expressions and Inequalities: 6.EE.1-1, 6.EE.1-2, 6.EE.2a, 6.EE.2b, 6.EE.2c-1, 6.EE.2c-2, 6.EE.4			
Writes, reads and evaluates numerical and algebraic expressions, including those that contain whole number exponents.	Reads and evaluates numerical and algebraic expressions, including those that contain whole number exponents.	Reads numerical and algebraic expressions including those that contain whole number exponents.	
	Writes numerical expressions and some algebraic expressions, including those that contain whole number exponents.		
Identifies parts of algebraic and numerical expressions using mathematical terms and views one or more parts of an expression as a single entity.	Identifies parts of algebraic and numerical expressions using mathematical terms.	Identifies parts of algebraic and numerical expressions using mathematical terms.	Identifies parts of an algebraic or numerical expression using mathematical terms.
Identifies equivalent expressions using properties of operations.	Identifies equivalent expressions using properties of operations.		

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 6 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Equations and Inequalities: 6.EE.5-1, 6.EE.5-2, 6.EE.6, 6.EE.7, 6.EE.8, 6.EE.9			
Uses variables to represent numbers and writes expressions and single-step equations to solve real-world and mathematical problems and understand their solutions.	Uses variables to represent numbers and writes expressions and single-step equations to solve real-world or mathematical problems.	Uses variables to represent numbers and writes expressions without exponents, and single-step equations to solve mathematical problems.	Uses variables to represent numbers and writes expressions without exponents, and single-step equations to solve mathematical problems
Expresses a relationship between dependent and independent variables and relates tables and graphs to equations.	Relates tables and graphs to the equations.	Relates tables and graphs to the equations.	
Writes and graphs inequalities to represent a constraint or condition in a real-world or mathematical problem.	Writes and graphs inequalities to represent a constraint or condition in a real-world or mathematical problem.	Graphs inequalities to represent a constraint or condition in a mathematical problem.	
Understands that there are an infinite number of solutions for an inequality.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 6 Math: Content (Sub-Claim B)

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Factors and Multiples: 6.NS.4-1, 6.NS.4-2			
Finds greatest common factors and least common multiples..	Finds greatest common factors and least common multiples.	Identifies greatest common factors and least common multiples.	Identifies greatest common factors or least common multiples.
Uses the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor	Uses the distributive property to rewrite a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor.		
Geometry: 6.G.1, 6.G.2-1, 6.G.2-2, 6.G.3, 6.G.4			
Solves real-world and mathematical problems involving area of polygons by composing into rectangles or decomposing into triangles and other shapes.	Solves real-world and mathematical problems involving area of polygons by either composing into rectangles or decomposing into triangles and other shapes.	Solves mathematical problems involving area of polygons by either composing into rectangles or decomposing into triangles and other shapes.	Solves mathematical problems involving area of polygons by composing into rectangles.
Determines measurements of polygons in the coordinate plane.	Determines measurements of polygons in the coordinate plane.	Determines measurements of polygons in the coordinate plane.	
Determines and uses nets of three-dimensional figures to find surface area.	Determines and uses nets of three-dimensional figures to find surface area.	Uses nets of three-dimensional figures to find surface area.	
Determines volume of right rectangular prisms with fractional edge lengths by packing them with unit cubes and using formulas.	Determines volume of right rectangular prisms with fractional edge lengths by packing them with unit cubes and using formulas.	Determines volume of right rectangular prisms with fractional edge lengths by packing them with unit cubes and using formulas.	
Uses volume formulas to find unknown measurements.			

## GRADES 6-8 MATHEMATICS

### Performance Level Descriptors

#### Grade 6 Math: Content (Sub-Claim B)

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Understands the concepts of area and volume to solve unscaffolded problems.			
Statistics and Probability: 6.SP.1, 6.SP.2, 6.SP.3, 6.SP.4, 6.SP.5			
Recognizes a statistical question and understands that a set of collected data has a distribution which can be described by its center, spread and overall shape.	Recognizes a statistical question and understands that a set of collected data has a distribution which can be described by its center, spread and overall shape.	Recognizes a statistical question and understands that a set of collected data has a distribution which can be described by its center, spread and overall shape.	Understands that a set of collected data has a distribution which can be described by its center, spread and overall shape.
Understands the purpose of center and variability and that it can be summarized with a single number.	Understands the purpose of center and that it can be summarized with a single number.	Understands the purpose of center and that it can be summarized with a single number.	Understands that the center of a set of data can be summarized with a single number.
Displays numerical data in plots on a number line, including dot plots, histograms and box plots, and determines which display is the most appropriate.	Displays numerical data in plots on a number line, including dot plots, histograms and box plots.	Displays numerical data on a number line including dot plots and histograms.	Displays numerical data on a number line including dot plots.
Summarizes numerical data sets in relation to their context, such as by reporting the number of observations, describing the nature of the attributes under investigation and using measures of center and variability.	Summarizes numerical data sets in relation to their context, such as by reporting the number of observations, describing the nature of the attributes under investigation and using measures of center and variability.	Summarizes numerical data sets in relation to their context, such as by reporting the number of observations and describing and using measures of center and using the interquartile range as a measure of variability.	
Determines which measures of center and variability are the most appropriate for a set of data.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 6 Math: Content (Sub-Claim B)

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Operations with Multi-Digit Numbers: 6.NS.2, 6.NS.3-1, 6.NS.3-2, 6.NS.3-3, 6.NS.3-4, 6.Int.1			
Solves two-step word problems and other problems by dividing multi-digit numbers and adding, subtracting, multiplying and dividing multi-digit decimals and assesses reasonableness of the result using different methods.	Solves one-step word problems and other problems with some level of accuracy by dividing multi-digit numbers and adding, subtracting, multiplying and dividing multi-digit decimals.	Solves one-step problems by dividing multi-digit numbers and adding, subtracting, multiplying and dividing multi-digit decimals.	Solves one-step problems with limited accuracy by dividing multi-digit numbers and adding, subtracting, multiplying and dividing multi-digit decimals.

## GRADES 6-8 MATHEMATICS

### Performance Level Descriptors

#### Grade 6: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Properties of Operations: 6.C.1.1, 6.C.2			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting, and critiquing the validity and efficiency of other’s responses, approaches and reasoning, and providing counter-examples where applicable</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of</li> <li>• other’s responses, approaches and reasoning</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, which may include:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an incomplete or illogical progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>

# GRADES 6-8 MATHEMATICS

## Performance Level Descriptors

Grade 6: Reasoning (Sub-Claim C)			
In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Concrete Referents and Diagrams: 6.C.3, 6.C.4, 6.C.5			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as: diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting and critiquing the validity and efficiency of other’s responses, approaches and reasoning, and</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as: diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches and reasoning.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response based on concrete referents provided in the prompt or in simple cases, constructed by the student such as: diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on concrete referents provided in the prompt such as: diagrams, number line diagrams or coordinate plane diagrams, which may include:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated or faulty assumptions</li> <li>• an incomplete or illogical progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>



## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 6: Reasoning (Sub-Claim C)			
In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
provides a counter-example where applicable			
Distinguish Correct Explanation/ Reasoning from that which is Flawed: 6.C.6, 6.C.7, 6.C.8.1, 6.C.8.2, 6.C.9			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>a logical approach based on a conjecture and/or stated assumptions</li> <li>a logical and complete progression of steps</li> <li>precision of calculation</li> <li>correct use of grade-level vocabulary, symbols and labels</li> <li>complete justification of a conclusion</li> <li>generalization of an argument or conclusion</li> <li>evaluating, interpreting and critiquing the validity and efficiency of other’s responses, approaches and reasoning, and providing a counter-example where applicable.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>a logical approach based on a conjecture and/or stated assumptions</li> <li>a logical and complete progression of steps</li> <li>precision of calculation</li> <li>correct use of grade-level vocabulary, symbols and labels</li> <li>complete justification of a conclusion</li> <li>evaluating, interpreting and critiquing the validity of other’s responses, approaches and reasoning.</li> <li>identifying and describing error in solutions and presents correct solutions.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>a logical approach based on a conjecture and/or stated assumptions</li> <li>a logical, but incomplete, progression of steps</li> <li>minor calculation errors</li> <li>some use of grade-level vocabulary, symbols and labels</li> <li>partial justification of a conclusion</li> <li>evaluating the validity of other’s approaches and conclusion.</li> <li>identifying and describing errors in solutions.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>an approach based on a conjecture and/or stated or faulty assumptions</li> <li>an incomplete or illogical progression of steps</li> <li>major calculation errors</li> <li>limited use of grade-level vocabulary, symbols and labels</li> <li>partial justification of a conclusion.</li> </ul>

**GRADES 6-8 MATHEMATICS**  
**Performance Level Descriptors**

Grade 6: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
<ul style="list-style-type: none"> <li>identifying and describing errors in solutions and presents correct solutions.</li> <li>distinguishing correct explanation/reasoning from that which is flawed. If there is a flaw, presents correct reasoning.</li> </ul>			

## GRADES 6-8 MATHEMATICS

### Performance Level Descriptors

#### Grade 6: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Modeling: 6.D.1, 6.D.2, 6.D.3			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and making assumptions and approximations to simplify a real-world situation</li> <li>• mapping relationships between important quantities by selecting appropriate tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing a complete, clear and correct algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and making assumptions and approximations to simplify a real-world situation</li> <li>• mapping relationships between important quantities by selecting appropriate tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing a complete, clear, and correct algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and approximations to simplify a real-world situation</li> <li>• illustrating relationships between important quantities by using provided tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing an incomplete algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and approximations to simplify a real-world situation</li> <li>• identifying important quantities by using provided tools to create models</li> <li>• analyzing relationships mathematically to draw conclusions</li> <li>• writing an incomplete algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• using functions to describe how one quantity of interest depends on another</li> <li>• using unreasonable estimates of known quantities in a chain of</li> </ul>

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 6: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
<ul style="list-style-type: none"> <li>• writing/using functions to describe how one quantity of interest depends on another</li> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• improving the model if it has not served its purpose</li> <li>• interpreting mathematical results in the context of the situation</li> <li>• analyzing and/or creating limitations, relationships and interpreting goals within the model</li> <li>• analyzing, justifying and defending models which lead to a conclusion</li> </ul>	<ul style="list-style-type: none"> <li>• writing/using functions to describe how one quantity of interest depends on another</li> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• improving the model if it has not served its purpose</li> <li>• interpreting mathematical results in the context of the situation</li> </ul>	<ul style="list-style-type: none"> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• modifying the model if it has not served its purpose</li> <li>• interpreting mathematical results in a simplified context</li> </ul>	<p style="text-align: center;">reasoning that yields an estimate of an unknown quantity</p>

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 7 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Proportional Relationships: 7.RP.1, 7.RP.2a, 7.RP.2b, 7.RP.2c, 7.RP.2d, 7.RP.3–1, 7.RP.3–2			
Analyzes and uses proportional relationships to solve real-world and mathematical problems, including multi-step ratio/percent problems.	Analyzes and uses proportional relationships to solve real-world and mathematical problems, including simple ratio/percent problems.	Uses proportional relationships to solve real-world and mathematical problems, including simple ratio/percent problems.	Identifies proportional relationships to solve mathematical problems, including ratio/percent problems.
Computes unit rates of quantities associated with ratios of fractions.	Computes unit rates of quantities associated with ratios of fractions.	Computes unit rates of quantities associated with ratios of fractions.	Identifies whether two quantities are in a proportional relationship.
Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality (unit rate) in tables, equations, diagrams, verbal descriptions and graphs.	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality (unit rate) in tables, equations, diagrams, verbal descriptions and graphs	Decides whether two quantities are in a proportional relationship and identifies the constant of proportionality (unit rate) in tables, equations, diagrams, verbal descriptions and graphs.	
Interprets a point $(x, y)$ on the graph of a proportional relationship in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where $r$ is the unit rate.	Interprets a point $(x, y)$ on the graph of a proportional relationship in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where $r$ is the unit rate.		
Represents proportional relationships by equations and uses them to solve mathematical and real-world problems, including multi-step ratio and percent problems.	Represents proportional relationships by equations and uses them to solve mathematical and real-world problems, including simple ratio and percent problems.	Uses equations representing a proportional relationship to solve mathematical and real-world problems, including ratio and percent problems.	
Determines when it is appropriate to use a unit rate and understands its limitations.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 7 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Operations with Fractions: 7.NS.1a, 7.NS.1b-1, 7.NS.1b-2, 7.NS.1c-1, 7.NS.1d, 7.NS.2a-1, 7.NS.2a-2, 7.NS.2b-1, 7.NS.2b-2, 7.NS.2c, 7.NS.3, 7.EE.3			
Performs operations on positive and negative rational numbers in multi-step mathematical and real-world problems.	Performs operations on positive and negative rational numbers in multi-step mathematical and real-world problems.	Performs operations on positive and negative rational numbers in mathematical and real-world problems.	Performs operations on positive and negative rational numbers in mathematical problems.
Represents addition and subtraction on a horizontal or vertical number line and recognizes situations in which opposite quantities combine to make zero.	Represents addition and subtraction on a horizontal or vertical number line and recognizes situations in which opposite quantities combine to make zero.	Represents addition and subtraction on a horizontal or vertical number line and recognizes situations in which opposite quantities combine to make zero.	Represents addition and subtraction on a horizontal or vertical number line.
Determines reasonableness of a solution and interprets solutions in real-world contexts.	Determines reasonableness of a solution.		
Using the properties of operations, justifies the steps taken to solve multi-step mathematical and real-world problems involving rational numbers.			
Expressions, Equations and Inequalities: 7.EE.1, 7.EE.2, 7.EE.4a-1, 7.EE.4a-2, 7.EE.4b			
Applies properties of operations as strategies to add, subtract, factor and expand linear expressions.	Applies properties of operations as strategies to add, subtract, factor and expand linear expressions.	Applies properties of operations as strategies to add, subtract and expand linear expressions.	Applies properties of operations as strategies to add and subtract linear expressions.
Solves multi-step linear equations with rational coefficients.	Solves two-step linear equations with rational coefficients.	Solves two-step linear equations with rational coefficients.	Solves one-step linear equations with rational coefficients.
In mathematical or real-world contexts, uses variables to represent quantities, construct and solve equations and inequalities, and graph and interpret solution sets.	In a mathematical or real-world context, uses variables to represent quantities, construct and solve equations and inequalities, and graph solution sets.	In a mathematical context, uses variables to represent quantities, construct and solve equations and inequalities, and graph solution sets.	

**GRADES 6-8 MATHEMATICS**  
**Performance Level Descriptors**

Grade 7 Math: Content (Sub-Claim A)

The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Rewrites an expression in different forms.			
Describes the relationship between equivalent quantities that are expressed algebraically in different forms in a problem context and explains their equivalence in light of the context of the problem.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 7 Math: Content (Sub-Claim B)			
The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Representing Geometric Figures: 7.G.2, 7.G.3			
Draws geometric figures – freehand, with a ruler and protractor or with technology – and describes their attributes.	Draws geometric figures – freehand, with a ruler and protractor or with technology – and describes their attributes.	Draws geometric figures – freehand, with a ruler and protractor, or with technology – and describes some of their attributes.	Draws geometric figures – freehand, with a ruler and protractor, or with technology – and describes some of their attributes.
Constructs triangles with given angle and side conditions and notices when those conditions determine a unique triangle, more than one triangle or no triangle.	Constructs triangles with given angle and side conditions.	Constructs triangles with given angle and side conditions.	
Describes two-dimensional figures that result from slicing three-dimensional figures by a plane which may or may not be parallel or perpendicular to a base or face.	Describes the two-dimensional figures that result from slicing three-dimensional figures by a plane parallel or perpendicular to a base or face.		
Drawings and Measurement: 7.G.1, 7.G.4–1, 7.G.4–2, 7.G.5, 7.G.6			
Solves mathematical and real-world problems involving circumference, area, surface area and volume of two- and three-dimensional objects, including composite objects.	Solves mathematical and real-world problems involving circumference, area, surface area and volume of two- and three-dimensional objects.	Solves mathematical problems involving circumference, area, surface area and volume of two- and three-dimensional objects.	Solves mathematical problems involving circumference and area of two-dimensional objects.
Solves problems involving scale drawings of geometric figures, including reproducing a scale drawing at a different scale.	Solves problems involving scale drawings of geometric figures, including reproducing a scale drawing at a different scale.	Solves problems involving scale drawings of geometric figures.	Solves problems involving scale drawings of geometric figures.
Represents angle relationships using equations to solve for unknown angles.	Represents angle relationships using equations to solve for unknown angles.	Uses facts about angle relationships to determine the measure of unknown angles.	



## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 7 Math: Content (Sub-Claim B)

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Produces a logical conclusion about the relationship between the circumference and area of a circle.			
Random Sampling and Comparative Inferences: 7.SP.1, 7.SP.2, 7.SP.3, 7.SP.4			
Understands and uses random sampling to draw inferences about a population.	Understands and uses random sampling to draw inferences about a population.	Draws inferences about a population from a table or graph of random samples.	Compares two populations based on measures of center and measures of variability.
Draws relevant informal comparative inferences about two populations, including assessing the degree of visual overlap of two numerical data distributions with similar variabilities.	Draws relevant informal comparative inferences about two populations.	Draws informal comparative inferences about two populations.	
Generates multiple samples of the same size to gauge the variation in estimates or predictions.			
Analyzes whether a sample is representative of a population.			
Chance Processes and Probability Models: 7.SP.5, 7.SP.6, 7.SP.7a, 7.SP.7b, 7.SP.8a, 7.SP.8b, 7.SP.8c			
Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.	Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.	Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.	Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.
Generates a sample space to determine the probability of simple or compound events using methods such as organized lists, tables, tree diagrams or simulations.	Finds probabilities when given sample spaces for simple and compound events using methods such as organized lists, tables and tree diagrams.	Finds probabilities when given sample spaces for simple events using methods such as organized lists and tables.	

**GRADES 6-8 MATHEMATICS**  
**Performance Level Descriptors**

Grade 7 Math: Content (Sub-Claim B)

The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Approximates the probability of a chance event by collecting data.			
	Develops a model to approximate the probability of a chance event and predicts approximate frequencies when given the probability or by observing frequencies in data generated from the process.		
Develops probability models to determine the probabilities of events.			
Designs and uses a simulation to generate frequencies for compound events.			
Designs and uses a simulation to estimate the probability of a compound event.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 7 Math: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Properties of Operations: 7.C.1.1, 7.C.1.2, 7.C.2			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting, and critiquing the validity of other’s responses, approaches, conclusions and reasoning, and correcting and providing counter-examples where applicable.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions, and reasoning.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on the properties of operations and the relationship between addition and subtraction or between multiplication and division, including:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an incomplete or illogical progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>

## GRADES 6-8 MATHEMATICS

### Performance Level Descriptors

#### Grade 7 Math: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Concrete Referents and Diagrams: 7.C.3, 7.C.4			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting and critiquing the validity and efficiency of other’s responses, approaches, conclusions and</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as: diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions and reasoning.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on concrete referents provided in the prompt or in simple cases, constructed by the student such as: diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluation the validity of other’s approaches and conclusions.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on concrete referents provided in the prompt such as: diagrams, number line diagrams or coordinate plane diagrams, which may include:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an illogical and incomplete progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 7 Math: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
reasoning, and providing a counterexample where applicable.			
Distinguish Correct Explanation / Reasoning from that which is Flawed: 7.C.5, 7.C.6.1, 7.C.7.1, 7.C.7.2, 7.C.7.3, 7.C.7.4, 7.C.8			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting and critiquing the validity and efficiency of other’s responses, approaches, conclusions and reasoning, and provides a counterexample where applicable.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions and reasoning.</li> <li>• identifying and describing errors in solutions and presents correct solutions.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions.</li> <li>• identifying and describing errors in solutions.</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an illogical and incomplete progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>

**GRADES 6-8 MATHEMATICS**  
**Performance Level Descriptors**

Grade 7 Math: Reasoning (Sub-Claim C)

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
<ul style="list-style-type: none"> <li>identifying and describing errors in solutions and presents correct solutions</li> <li>distinguishing correct explanation/reasoning from that which is flawed. If there is a flaw, presents correct reasoning.</li> </ul>			

# GRADES 6-8 MATHEMATICS

## Performance Level Descriptors

### Grade 7 Math: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Modeling: 7.D.1, 7.D.2, 7.D.3, 7.D.4			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and making assumptions and approximations to simplify a real-world situation</li> <li>• mapping relationships between important quantities by selecting appropriate tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing a complete, clear and correct algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and making assumptions and approximations to simplify a real-world situation</li> <li>• mapping relationships between important quantities by selecting appropriate tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing a complete, clear and correct algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and approximations to simplify a real-world situation</li> <li>• illustrating relationships between important quantities by using provided tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing an incomplete algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> <li>• using reasonable estimates of known quantities in a chain of</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and approximations to simplify a real-world situation</li> <li>• identifying important quantities using provided tools to create models</li> <li>• analyzing relationships mathematically to draw conclusions</li> <li>• writing an incomplete algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning using functions to describe how one quantity of interest depends on another</li> <li>• using unreasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> </ul>

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 7 Math: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for the making use of structure and/or looking for and expressing regularity in repeated reasoning

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
<ul style="list-style-type: none"> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• improving the model if it has not served its purpose</li> <li>• interpreting mathematical results in the context of the situation</li> <li>• analyzing and/or creating constraints, relationships and goals</li> <li>• analyzing, justifying and defending models which lead to a conclusion</li> </ul>	<ul style="list-style-type: none"> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• improving the model if it has not served its purpose</li> <li>• interpreting mathematical results in the context of the situation</li> </ul>	<ul style="list-style-type: none"> <li>reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• modifying the model if it has not served its purpose</li> <li>• interpreting mathematical results in a simplified context</li> </ul>	



## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Expressions and Equations: 8.EE.1, 8.EE.2			
Evaluates and generates equivalent numerical expressions using and applying properties of integer exponents.	Evaluates and generates equivalent numerical expressions using and applying properties of integer exponents.	Evaluates numerical expressions using properties of integer exponents.	Evaluates numerical expressions using properties of integer exponents.
Solves equations of the form $x^2 = p$ and $\sqrt[3]{x} = p$ , $x$ representing solutions using $\sqrt{\quad}$ or $\sqrt[3]{\quad}$ symbols.	Solves equations of the form $x^2 = p$ , where $p$ is a perfect square, and solves equations of the form $x^3 = p$ , where $p$ is a perfect cube.	Partially solves equations of the form $x^2 = p$ , where $p$ is a positive rational number and a perfect square less than or equal to 100, by representing only the positive solution of the equation.	
Scientific Notation: 8.EE.3, 8.EE.4-1, 8.EE.4-2			
Using scientific notation, estimates very large and very small quantities and determines how many times as large one number is in relation to another.	Using scientific notation, estimates very large and very small quantities.	Using scientific notation, estimates very large quantities.	Using scientific notation, estimates very large quantities.
Performs operations with numbers expressed in scientific notation. Interprets scientific notation that has been generated by technology.	Performs operations with numbers expressed in scientific notation.	Performs operations with numbers expressed in scientific notation.	
Chooses appropriate units for measuring very large or very small quantities.			
Interprets scientific notation in context.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Proportional Relationships and Linear Equations: 8.EE.5-1, 8.EE.5-2, 8.EE.6, 8.F.3-1			
Graphs linear relationships in the form $y=mx+b$ , including proportional relationships.	Graphs linear relationships, in the form $y=mx+b$ , including proportional relationships.	Graphs linear relationships, in the form $y=mx+b$ , including proportional relationships.	Graphs linear relationships, in the form $y=mx+b$ .
Interprets the unit rate as the slope of the graph of a proportional relationship and applies these concepts to solve real-world problems	Interprets the unit rate as the slope of the graph of a proportional relationship and applies these concepts to solve real-world problems.	Interprets the unit rate as the slope of the graph of a proportional relationship.	
Compares two different proportional relationships represented in different ways.	Compares two different proportional relationships represented in different ways.	Makes some comparisons between two different proportional relationships represented in different ways.	
Interprets $y=mx+b$ as defining a linear function.			
Uses similar triangles to show that the slope is the same between any two distinct points on a non-vertical line in the coordinate plane.			
Solving Linear Equations: 8.EE.7b, 8.EE.C.Int.1			
Solves mathematical and real-world problems involving linear equations in one variable, with rational number coefficients, including those that require use of the distributive property and combining like terms.	Solves linear equations in one variable, with rational number coefficients, including those that require use of the distributive property and combining like terms.	Solves linear equations in one variable, with rational number coefficients, including those that require use of the distributive property or combining like terms.	Solves linear equations in one variable, with rational number coefficients.

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Simultaneous Linear Equations: 8.EE.8a, 8.EE.8b-1, 8.EE.8b-2, 8.EE.8b-3, 8.EE.8c			
Analyzes and solves mathematical and real-world problems leading to pairs of simultaneous linear equations graphically, algebraically and by inspection.	Analyzes and solves mathematical problems leading to pairs of simultaneous linear equations graphically and algebraically.	Solves mathematical problems leading to pairs of simultaneous linear equations graphically and by inspection.	Solves mathematical problems leading to pairs of simultaneous linear equations graphically, where the graph is provided.
Understands the relationship between the graphic representation and the algebraic solution to the system.			
Verifies a solution utilizing multiple methods to prove accuracy.			
Functions: 8.F.1-1, 8.F.1-2, 8.F.2, 8.F.3-2			
Understands that a function is a rule assigning to each input exactly one output, which can be graphed as a set of ordered pairs.	Understands that a function is a rule that assigns to each input exactly one output and can be graphed as a set of ordered pairs.	Understands that a function is a rule that assigns to each input exactly one output and can be graphed as a set of ordered pairs.	Understands that a function is a rule that assigns to each input exactly one output.
Compares properties of two functions represented in different ways.	Compares some of the properties of two functions represented in different ways.		
Identifies and proves functions that are non-linear.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8 Math: Content (Sub-Claim A)			
The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Congruence and Similarity: 8.G.1a, 8.G.1b, 8.G.1c, 8.G.2, 8.G.3, 8.G.4			
Describes the effect of dilations, translations, rotations and reflections on two-dimensional figures with and without coordinates, determines whether two given figures are congruent or similar through one or more transformations and describes the sequence of transformations to justify congruence or similarity of two figures.	Describes the effect of dilations, translations, rotations and reflections on two-dimensional figures with coordinates, and determines whether two given figures are congruent or similar through one or more transformations.	Describes the effect of translations, rotations and reflections on two-dimensional figures without coordinates and determines whether two given figures are congruent.	Describes the effect of translations, rotations or reflections on two-dimensional figures without coordinates and determines whether two given figures are congruent.
Pythagorean Theorem: 8.G.7-1, 8.G.7-2, 8.G.8			
Applies the Pythagorean Theorem in real world and mathematical problems in two and three dimensions and to find the distance between two points in a coordinate system.	Applies the Pythagorean Theorem in a simple planar case and to find the distance between two points in a coordinate system.	Applies the Pythagorean Theorem in solving for any side of the right triangle in a simple planar case without coordinates.	Applies the Pythagorean Theorem in solving for the hypotenuse of a right triangle in a simple planar case without coordinates.
Recognizes situations to apply the Pythagorean Theorem in multi-step problems.			

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8 Math: Content (Sub-Claim B)			
The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Rational Numbers: 8.NS.1, 8.NS.2			
Distinguishes between rational and irrational numbers, understands that these numbers have decimal expansions and approximates their locations on a number line, and converts between terminating decimals or decimals that repeat eventually and fractional representations of rational numbers.	Distinguishes between rational and irrational numbers, understands that these numbers have decimal expansions and approximates their locations on a number line, and converts between terminating decimals or repeating decimals of the form (0.aaa...) and fractional representations of rational numbers.	Distinguishes between rational and irrational numbers and understands that these numbers have decimal expansions and approximates their locations on a number line.	Distinguishes between rational and irrational numbers and approximates their locations on a number line.
Modeling with Functions: 8.F.4, 8.F.5-1, 8.F.5-2			
Constructs a function to model a linear relationship between two quantities described with or without a context.	Constructs a function to model a linear relationship between two quantities described with or without a context.	Constructs a function to model a linear relationship between two quantities in a table or a graph.	Identifies a function to model a linear relationship between two quantities in a table or a graph.
Given a description of a relationship or two $(x,y)$ values in a table of values or a graph, determines the rate of change and initial value of the function.	Given two $(x,y)$ values in a table of values or a graph, determines the rate of change and initial value of the function.	Determines the rate of change and initial value of the function from a table or graph that contains the initial value.	Determines the rate of change or initial value of the function from a table or graph that contains the initial value.
Analyzes and describes the functional relationship between two quantities.	Analyzes the graph of a linear function to describe the functional relationship between two quantities.	Analyzes the graph of a linear function to describe the functional relationship between two quantities.	
Sketches a graph of a function when given a written description.	Sketches the graph of a function when given a written description.		

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8 Math: Content (Sub-Claim B)			
The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Volume: 8.G.9			
Identifies the formulas for the volume of cones, cylinders and spheres, and uses them to find the volume or dimensions of solids in mathematical and real-world problems.	Identifies the formulas for the volume of cones, cylinders and spheres, and uses them to find the volume of solids in mathematical and real-world problems.	Identifies the formulas for the volume of cones, cylinders and spheres, and uses them to find the volume of solids in mathematical problems.	Identifies the formulas for the volume of cones, cylinders and spheres.
Applies these formulas to multiple composite mathematical solids.			
Bivariate Data: 8.SP.1, 8.SP.2, 8.SP.3, 8.SP.4			
Analyzes and describes the patterns of association that can be seen in bivariate data by constructing, displaying and interpreting scatter plots and two-way tables.	Analyzes and describes the patterns of association that can be seen in bivariate data by constructing, displaying and interpreting scatter plots and two-way tables.	Describes the patterns of association that can be seen in bivariate data by interpreting scatter plots and two-way tables.	Describes the patterns of association that can be seen in bivariate data by interpreting scatter plots and two-way tables.
Uses the equation of a linear model to solve problems in context.	Uses the equation of a linear model to solve problems in context.	Uses a given equation of a linear model to solve problems in context.	
Informally fits a straight line to a scatter plot that suggests a linear association and assesses the model fit.	Informally fits a straight line to a scatter plot that suggests a linear association.	Identifies a line of best fit for a scatter plot that suggests a linear association.	
Compares linear models used to fit the same set of data to determine which is a better fit.			

## GRADES 6-8 MATHEMATICS

### Performance Level Descriptors

Grade 8: Reasoning (Sub-Claim C)			
In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Graphs and Equations: 8.C.1.1, 8.C.1.2, 8.C.2			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on the principle that a graph of an equation in two variables is the set of all its solutions and a given equation or system of equations including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting, and critiquing the validity and</li> <li>• efficiency of other’s responses, approaches and reasoning, conclusions and reasoning</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on the principle that a graph of an equation in two variables is the set of all its solutions and a given equation or system of equations including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions and reasoning</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response based on the principle that a graph of an equation in two variables is the set of all its solutions and a given equation or system of equations including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on the principle that a graph of an equation in two variables is the set of all its solutions and a given equation or system of equations including:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an illogical or incomplete progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

Grade 8: Reasoning (Sub-Claim C)			
In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
correcting and providing a counterexample where applicable.			
Reasoning: 8.C.3.1, 8.C.3.2, 8.C.3.3, 8.C.4.1, 8.C.6			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on a chain of reasoning to justify or refute algebraic, function or linear-equation propositions or conjectures including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions and reasoning,</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on a chain of reasoning to justify or refute algebraic, function or linear-equation propositions or conjectures including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions and reasoning</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response based on a chain of reasoning to justify or refute algebraic, function or linear-equation propositions or conjectures including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on a chain of reasoning to justify or refute algebraic, function or linear-equation propositions or conjectures including:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an illogical and incomplete progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion.</li> </ul>



## GRADES 6-8 MATHEMATICS

### Performance Level Descriptors

Grade 8: Reasoning (Sub-Claim C)			
In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.			
Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
correcting and providing a counterexample where applicable			
Geometric Reasoning: 8.C.5.1, 8.C.5.2, 8.C.5.3			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on applying geometric reasoning in a coordinate setting and/or use coordinates to draw geometric conclusions including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• generalization of an argument or conclusion</li> <li>• evaluating, interpreting and critiquing the validity and efficiency of other’s responses, approaches and reasoning, correcting and providing a counterexample where applicable</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student clearly constructs and communicates a complete response based on applying geometric reasoning in a coordinate setting and/or use coordinates to draw geometric conclusions including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical and complete progression of steps</li> <li>• precision of calculation</li> <li>• correct use of grade-level vocabulary, symbols and labels</li> <li>• complete justification of a conclusion</li> <li>• evaluating, interpreting and critiquing the validity of other’s responses, approaches, conclusions and reasoning</li> <li>• identifying and describing errors in solutions and presenting correct solutions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates a complete response based on applying geometric reasoning in a coordinate setting and/or use coordinates to draw geometric conclusions including:</p> <ul style="list-style-type: none"> <li>• a logical approach based on a conjecture and/or stated assumptions</li> <li>• a logical, but incomplete, progression of steps</li> <li>• minor calculation errors</li> <li>• some use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> <li>• evaluating the validity of other’s approaches and conclusions</li> <li>• identifying and describing errors in solutions</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student constructs and communicates an incomplete response based on applying geometric reasoning in a coordinate setting and/or use coordinates to draw geometric conclusions including:</p> <ul style="list-style-type: none"> <li>• a faulty approach based on a conjecture and/or stated assumptions</li> <li>• an illogical and incomplete progression of steps</li> <li>• major calculation errors</li> <li>• limited use of grade-level vocabulary, symbols and labels</li> <li>• partial justification of a conclusion</li> </ul>

**GRADES 6-8 MATHEMATICS**  
**Performance Level Descriptors**

**Grade 8: Reasoning (Sub-Claim C)**

In connection with content, the student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others and/or attending to precision when making mathematical statements.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
<ul style="list-style-type: none"> <li>identifying and describing errors in solutions and presenting correct solutions</li> <li>distinguishing correct explanation/reasoning from that which is flawed. If there is a flaw, presents correct reasoning.</li> </ul>			

# GRADES 6-8 MATHEMATICS

## Performance Level Descriptors

### Grade 8: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for and making use of structure and/or looking for and expressing regularity in repeated reasoning.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
Modeling: 8.D.1, 8.D.2, 8.D.3, 8.D.4			
<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and making assumptions and approximations to simplify a real-world situation</li> <li>• mapping relationships between important quantities by selecting appropriate tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing a complete, clear and correct algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and making assumptions and approximations to simplify a real-world situation</li> <li>• mapping relationships between important quantities by selecting appropriate tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing a complete, clear and correct algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and approximations to simplify a real-world situation</li> <li>• illustrating relationships between important quantities by using provided tools to create models</li> <li>• analyzing relationships mathematically between important quantities to draw conclusions</li> <li>• writing an incomplete algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• writing/using functions to describe how one quantity of interest depends on another</li> <li>• using reasonable estimates of known quantities in a chain of</li> </ul>	<p>In connection with the content knowledge, skills, and abilities described in Sub-claim A, the student devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by:</p> <ul style="list-style-type: none"> <li>• using stated assumptions and approximations to simplify a real-world situation</li> <li>• identifying important quantities using provided tools to create models</li> <li>• analyzing relationships mathematically to draw conclusions</li> <li>• writing an incomplete algebraic expression or equation to describe a situation</li> <li>• applying proportional reasoning</li> <li>• using functions to describe how one quantity of interest depends on another</li> <li>• using unreasonable estimates of known quantities in a chain of</li> </ul>

## GRADES 6-8 MATHEMATICS Performance Level Descriptors

### Grade 8: Modeling (Sub-Claim D)

In connection with content, the student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them, reasoning abstractly, and quantitatively, using appropriate tools strategically, looking for and making use of structure and/or looking for and expressing regularity in repeated reasoning.

Exceeds Expectations	Meets Expectations	Approaches Expectations	Partially or Does Not Yet Meet Expectations
<ul style="list-style-type: none"> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• improving the model if it has not served its purpose</li> <li>• interpreting mathematical results in the context of the situation</li> <li>• analyzing and/or creating constraints, relationships and goals analyzing, justifying and defending models which lead to a conclusion</li> </ul>	<ul style="list-style-type: none"> <li>• using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity</li> <li>• reflecting on whether the results make sense</li> <li>• improving the model if it has not served its purpose</li> <li>• interpreting mathematical results in the context of the situation</li> </ul>	<p style="text-align: center;">reasoning that yields an estimate of an unknown quantity</p> <ul style="list-style-type: none"> <li>• reflecting on whether the results make sense</li> <li>• modifying the model if it has not served its purpose</li> <li>• interpreting mathematical results in a simplified context</li> </ul>	<p style="text-align: center;">reasoning that yields an estimate of an unknown quantity</p>