

Performance Level Descriptors – Grade 7 Mathematics

| | Grade 7 Math : Sub-Claim A | | | |
|---|--|--|---|--|
| | The student solves problems involving the Major Content for grade/course with connections to the Standards for Mathematical Practice. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| 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 | <p>Analyzes and uses proportional relationships to solve real-world and mathematical problems, including multi-step ratio/percent problems.</p> <p>Computes unit rates of quantities associated with ratios of fractions.</p> <p>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.</p> <p>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.</p> | <p>Analyzes and uses proportional relationships to solve real-world and mathematical problems, including multi-step ratio/percent problems.</p> <p>Computes unit rates of quantities associated with ratios of fractions.</p> <p>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.</p> <p>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.</p> | <p>Analyzes and uses proportional relationships to solve real-world and mathematical problems, including simple ratio/percent problems.</p> <p>Computes unit rates of quantities associated with ratios of fractions.</p> <p>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.</p> <p>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.</p> | <p>Uses proportional relationships to solve real-world and mathematical problems, including simple ratio/percent problems.</p> <p>Computes unit rates of quantities associated with ratios of fractions.</p> <p>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.</p> <p>Uses equations representing a proportional relationship to solve simple mathematical and real-world problems, including simple ratio and percent problems.</p> |

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| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | <p>Represents proportional relationships by equations and uses them to solve mathematical and real-world problems, including multi-step ratio and percent problems.</p> <p>Compares proportional relationships given in different forms (tables, equations, diagrams, verbal, graphs).</p> <p>Determines when it is appropriate to use unit rate and understands when it has its limitations.</p> | <p>Represents proportional relationships by equations and uses them to solve mathematical and real-world problems, including multi-step ratio and percent problems.</p> | <p>Represents proportional relationships by equations and uses them to solve mathematical and real-world problems, including simple ratio and percent problems.</p> | |
| <p>Operations with Fractions</p> <p>7.NS.1 7.NS.2 7.NS.3 7.EE.3</p> | <p>Performs operations on positive and negative rational numbers in mathematical and real-world problems.</p> <p>Represents addition and subtraction on a horizontal or vertical number line and</p> | <p>Performs operations on positive and negative rational numbers in multi-step mathematical and real-world problems.</p> <p>Represents addition and subtraction on a horizontal or vertical number line and</p> | <p>Performs operations on positive and negative rational numbers in multi-step mathematical and real-world problems.</p> <p>Represents addition and subtraction on a horizontal or vertical number line and</p> | <p>Performs operations on positive and negative rational numbers in simple mathematical and real-world problems.</p> <p>Represents addition and subtraction on a horizontal or vertical number line and</p> |

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| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | <p>recognizes situations in which opposite quantities combine to make zero.</p> <p>Determines reasonableness of a solution and interprets solutions in real-world contexts.</p> <p>Using the properties of operations, justifies the steps taken to solve multi-step mathematical and real-world problems involving rational numbers.</p> | <p>recognizes situations in which opposite quantities combine to make zero.</p> <p>Determines reasonableness of a solution and interprets solutions in real-world contexts.</p> | <p>recognizes situations in which opposite quantities combine to make zero.</p> <p>Determines reasonableness of a solution.</p> | <p>recognizes situations in which opposite quantities combine to make zero.</p> |
| <p>Expressions, Equations and Inequalities</p> <p>7.EE.1 7.EE.2 7.EE.4</p> | <p>Applies properties of operations as strategies to add, subtract, factor and expand linear expressions.</p> <p>Fluently solves multi-step linear equations with rational coefficients.</p> <p>In mathematical or real-world contexts, uses variables to represent</p> | <p>Applies properties of operations as strategies to add, subtract, factor and expand linear expressions.</p> <p>Fluently solves multi-step linear equations with rational coefficients.</p> <p>In mathematical or real-world contexts, uses variables to represent</p> | <p>Applies properties of operations as strategies to add, subtract, factor and expand linear expressions.</p> <p>Solves two-step linear equations with rational coefficients.</p> <p>In a mathematical or real-world context, uses variables to represent</p> | <p>Applies properties of operations as strategies to add, subtract and expand linear expressions.</p> <p>Solves two-step linear equations with rational coefficients.</p> <p>In a mathematical context, uses variables to represent quantities, construct and</p> |

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| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | <p>quantities, construct and solve simple equations and inequalities, and graph and interpret solution sets.</p> <p>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.</p> | <p>quantities, construct and solve simple equations and inequalities, and graph and interpret solution sets.</p> <p>Rewrites an expression in different forms.</p> | <p>quantities, construct and solve simple equations and inequalities, and graph solution sets.</p> | <p>solve simple equations and inequalities, and graph solution sets.</p> |

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|--|--|--|--|---|
| | The student solves problems involving the Additional and Supporting Content for the grade/course with connections to the Standards for Mathematical Practice. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| Representing Geometric Figures 7.G.2 7.G.3 | <p>Draws, with precision, geometric figures – freehand, with a ruler and protractor or with technology – and describes their attributes.</p> <p>Constructs triangles with given angle and side conditions and notices when those conditions determine a unique triangle, more than one triangle or no triangle.</p> <p>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.</p> | <p>Draws geometric figures – freehand, with a ruler and protractor or with technology – and describes their attributes.</p> <p>Constructs triangles with given angle and side conditions and notices when those conditions determine a unique triangle, more than one triangle or no triangle.</p> <p>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.</p> | <p>Draws geometric figures – freehand, with a ruler and protractor or with technology – and describes their attributes.</p> <p>Constructs triangles with given angle and side conditions.</p> <p>Describes the two-dimensional figures that result from slicing three-dimensional figures by a plane parallel or perpendicular to a base or face.</p> | <p>Draws geometric figures – freehand, with a ruler and protractor, or with technology – and describe some of their attributes.</p> <p>Constructs triangles with given angle and side conditions.</p> |
| Drawings and Measurement 7.G.1 7.G.4-1 7.G.4-2 | <p>Solves mathematical and real-world problems involving circumference, area, surface area and volume of two- and three-dimensional objects,</p> | <p>Solves mathematical and real-world problems involving circumference, area, surface area and volume of two- and three-dimensional objects,</p> | <p>Solves mathematical and real-world problems involving circumference, area, surface area and volume of two- and three-dimensional objects.</p> | <p>Solves mathematical problems involving circumference, area, surface area and volume of two- and three-dimensional objects.</p> |

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| 7.G.5 7.G.6 | <p>including composite objects.</p> <p>Solves problems involving scale drawings of geometric figures, including reproducing a scale drawing at a different scale.</p> <p>Represents angle relationships using equations to solve for unknown angles.</p> <p>Identifies or produces a logical conclusion about the relationship between the circumference and area of a circle.</p> | <p>including composite objects.</p> <p>Solves problems involving scale drawings of geometric figures, including reproducing a scale drawing at a different scale.</p> <p>Represents angle relationships using equations to solve for unknown angles.</p> | <p>Solves problems involving scale drawings of geometric figures, including reproducing a scale drawing at a different scale.</p> <p>Represents angle relationships using equations to solve for unknown angles.</p> | <p>Solves problems involving scale drawings of geometric figures.</p> <p>Uses facts about angle relationships to determine the measure of unknown angles.</p> |
| Random Sampling and Comparative Inferences 7.SP.1 7.SP.2 7.SP.3 7.SP.4 | <p>Understands and uses random sampling to draw inferences about a population.</p> <p>Draws relevant informal comparative inferences about two populations, including assessing the</p> | <p>Understands and uses random sampling to draw inferences about a population.</p> <p>Draws relevant informal comparative inferences about two populations, including assessing the</p> | <p>Understands and uses random sampling to draw inferences about a population.</p> <p>Draws relevant informal comparative inferences about two populations.</p> | <p>Draws inferences about a population from a table or graph of random samples.</p> <p>Draws simple informal comparative inferences about two populations.</p> |

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| | <p>degree of visual overlap of two numerical data distributions with similar variabilities.</p> <p>Generates multiple samples of the same size to gauge the variation in estimates or predictions.</p> <p>Analyzes whether a sample is representative of a population.</p> | <p>degree of visual overlap of two numerical data distributions with similar variabilities.</p> <p>Generates multiple samples of the same size to gauge the variation in estimates or predictions.</p> | | |
| <p>Chance Processes and Probability Models</p> <p>7.SP.5 7.SP.6 7.SP.7a 7.SP.7b 7.SP.8a 7.SP.8b 7.SP.8c</p> | <p>Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.</p> <p>Generates a sample space to determine the probability of simple or compound events using methods such as organized lists, tables, tree diagrams or simulations.</p> | <p>Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.</p> <p>Generates a sample space to determine the probability of simple or compound events using methods such as organized lists, tables, tree diagrams or simulations.</p> | <p>Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.</p> <p>Finds probabilities when given sample spaces for simple and compound events using methods such as organized lists, tables and tree diagrams.</p> | <p>Understands that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring.</p> <p>Finds probabilities when given sample spaces for simple events using methods such as organized lists and tables.</p> |

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| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | <p>Develops a model to approximate the probability of a chance event, predicts approximate frequencies when given the probability or by observing frequencies in data generated from the process, and compares probabilities from a model to observed frequencies.</p> <p>Designs and uses a simulation to estimate the probability of a compound event.</p> | <p>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.</p> <p>Uses a simulation to estimate the probability of a compound event.</p> | <p>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.</p> | |

Performance Level Descriptors – Grade 7 Mathematics

| | Grade 7: Sub-Claim C | | | |
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| | 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. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| Properties of Operations 7.C.1.1 7.C.1.2 7.C.2 | <p>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"> a logical approach based on a conjecture and/or stated assumptions a logical and complete progression of steps precision of calculation correct use of grade-level vocabulary, symbols and labels complete justification of a conclusion generalization of an argument or conclusion evaluating, interpreting, and critiquing the validity and efficiency | <p>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"> a logical approach based on a conjecture and/or stated assumptions a logical and complete progression of steps precision of calculation correct use of grade-level vocabulary, symbols and labels complete justification of a conclusion evaluating, interpreting and critiquing the validity of other's responses, approaches, | <p>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"> a logical approach based on a conjecture and/or stated assumptions a logical, but incomplete, progression of steps minor calculation errors some use of grade-level vocabulary, symbols and labels partial justification of a conclusion evaluating the validity of other's approaches and conclusion. | <p>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"> a faulty approach based on a conjecture and/or stated assumptions an incomplete or illogical progression of steps major calculation errors limited use of grade-level vocabulary, symbols and labels partial justification of a conclusion |

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| | 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. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | of other’s responses, approaches, conclusions and reasoning, and providing counter-examples where applicable. | conclusion, and reasoning. | | |
| Concrete Referents and Diagrams 7.C.3 7.C.4 | 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: <ul style="list-style-type: none"> a logical approach based on a conjecture and/or stated assumptions a logical and complete progression of steps | 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: <ul style="list-style-type: none"> a logical approach based on a conjecture and/or stated assumptions a logical and complete progression of steps | 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: <ul style="list-style-type: none"> a logical approach based on a conjecture and/or stated assumptions a logical, but incomplete, progression | 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: <ul style="list-style-type: none"> a faulty approach based on a conjecture and/or stated assumptions an illogical and incomplete progression of steps |

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| | 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. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | <ul style="list-style-type: none"> precision of calculation correct use of grade-level vocabulary, symbols and labels complete justification of a conclusion generalization of an argument or conclusion evaluating, interpreting and critiquing the validity and efficiency of other's responses, approaches, conclusions and reasoning, and providing a counter-example where applicable. | <ul style="list-style-type: none"> precision of calculation correct use of grade-level vocabulary, symbols and labels complete justification of a conclusion evaluating, interpreting and critiquing the validity of other's responses, approaches, conclusions and reasoning. | <ul style="list-style-type: none"> of steps minor calculation errors some use of grade-level vocabulary, symbols and labels partial justification of a conclusion evaluating the validity of other's approaches and conclusions. | <ul style="list-style-type: none"> major calculation errors limited use of grade-level vocabulary, symbols and labels partial justification of a conclusion |
| Distinguish Correct Explanation/ Reasoning from that which is Flawed | <p>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"> a logical approach | <p>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"> a logical approach | <p>Constructs and communicates a complete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> a logical approach | <p>Constructs and communicates an incomplete response to a given equation, multi-step problem, proposition or conjecture, including:</p> <ul style="list-style-type: none"> a faulty approach based |

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| | Grade 7: Sub-Claim C | | | |
|---|--|--|--|--|
| | 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. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| 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 | based on a conjecture and/or stated assumptions <ul style="list-style-type: none"> a logical and complete progression of steps precision of calculation correct use of grade-level vocabulary, symbols and labels complete justification of a conclusion generalization of an argument or conclusion evaluating, interpreting and critiquing the validity and efficiency of other's responses, approaches, conclusions and reasoning, and provides a counter-example where applicable. identifying and describing errors in solutions and presents correct solutions. distinguishing correct | based on a conjecture and/or stated assumptions <ul style="list-style-type: none"> a logical and complete progression of steps precision of calculation correct use of grade-level vocabulary, symbols and labels complete justification of a conclusion evaluating, interpreting and critiquing the validity of other's responses, approaches, conclusions and reasoning. identifying and describing errors in solutions and presents correct solutions. | based on a conjecture and/or stated assumptions <ul style="list-style-type: none"> a logical, but incomplete, progression of steps minor calculation errors some use of grade-level vocabulary, symbols and labels partial justification of a conclusion evaluating the validity of other's approaches and conclusion. identifying and describes errors in solutions. | on a conjecture and/or stated assumptions <ul style="list-style-type: none"> an illogical and incomplete progression of steps major calculation errors limited use of grade-level vocabulary, symbols and labels partial justification of a conclusion |

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| | Grade 7: Sub-Claim C | | | |
|--|---|--------------------------------|----------------------------------|---------------------------------|
| | 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. | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| | <p>explanation/reasoning from that which is flawed. If there is a flaw, presents correct reasoning.</p> | | | |

Performance Level Descriptors – Grade 7 Mathematics

| Grade 7 : Sub-Claim D | | | | |
|---|---|--|---|---|
| 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. | | | | |
| | | | | |
| | Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command |
| Modeling 7.D.1 7.D.2 7.D.3 7.D.4 | Devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by: <ul style="list-style-type: none"> using stated assumptions and making assumptions and approximations to simplify a real-world situation mapping relationships between important quantities by selecting appropriate tools to create models analyzing relationships mathematically between important quantities to draw conclusions writing a complete, clear and correct | Devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by: <ul style="list-style-type: none"> using stated assumptions and making assumptions and approximations to simplify a real-world situation mapping relationships between important quantities by selecting appropriate tools to create models analyzing relationships mathematically between important quantities to draw conclusions writing a complete, clear and correct | Devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by: <ul style="list-style-type: none"> using stated assumptions and approximations to simplify a real-world situation illustrating relationships between important quantities by using provided tools to create models analyzing relationships mathematically between important quantities to draw conclusions writing an incomplete algebraic expression or equation to describe a | Devises a plan to apply mathematics in solving problems arising in everyday life, society and the workplace by: <ul style="list-style-type: none"> using stated assumptions and approximations to simplify a real-world situation identifying important quantities using provided tools to create models analyzing relationships mathematically to draw conclusions writing an incomplete algebraic expression or equation to describe a situation applying proportional reasoning |

Performance Level Descriptors – Grade 7 Mathematics

| Grade 7 : Sub-Claim D | | | | |
|---|---|---|--|--|
| 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. | | | | |
| Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command | |
| algebraic expression or equation to describe a situation <ul style="list-style-type: none"> • applying proportional reasoning • writing/using functions to describe how one quantity of interest depends on another • using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity • reflecting on whether the results make sense • improving the model if it has not served its purpose • interpreting mathematical results in the context of the situation | algebraic expression or equation to describe a situation <ul style="list-style-type: none"> • applying proportional reasoning • writing/using functions to describe how one quantity of interest depends on another • using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity • reflecting on whether the results make sense • improving the model if it has not served its purpose • interpreting mathematical results in the context of the situation | situation <ul style="list-style-type: none"> • applying proportional reasoning • writing/using functions to describe how one quantity of interest depends on another • using reasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity • reflecting on whether the results make sense • modifying the model if it has not served its purpose • interpreting mathematical results in a simplified context | <ul style="list-style-type: none"> • using functions to describe how one quantity of interest depends on another • using unreasonable estimates of known quantities in a chain of reasoning that yields an estimate of an unknown quantity | |

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|---|-------------------------|---------------------------|--------------------------|--|
| 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. | | | | |
| Level 5: Distinguished Command | Level 4: Strong Command | Level 3: Moderate Command | Level 2: Partial Command | |
| <ul style="list-style-type: none"> • analyzing and/or creating constraints, relationships and goals • analyzing, justifying and defending models which lead to a conclusion | | | | |