



Indiana Academic Standards for Mathematics – Sixth Grade
 Adopted April 2014 – Standards Correlation Guide Document 5-28-2014

| | Indiana Academic Standard for Sixth Grade Mathematics – Adopted April 2014 | Indiana Academic Mathematics Standard Adopted 2000 | Common Core State Standard for Mathematics | Differences From Previous Standards |
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| Process Standards | | | | |
| <p>MA.6.PS.1: Make sense of problems and persevere in solving them.</p> | <p>Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway, rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" and "Is my answer reasonable?" They understand the approaches of others to solving complex problems and identify correspondences between different approaches. Mathematically proficient students understand how mathematical ideas interconnect and build on one another to produce a coherent whole.</p> | <p>6.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns.</p> <p>6.7.3 Decide when and how to break a problem into simpler parts.</p> <p>6.7.4 Apply strategies and results from simpler problems to solve more complex problems.</p> <p>6.7.7 Select and apply appropriate methods for estimating results of rational-number computations.</p> <p>6.7.10 Decide whether a solution is reasonable in the context of the original situation.</p> <p>6.7.11 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.</p> | <p>MP1 Make sense of problems and persevere in solving them. Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.</p> | <p>IAS 2014 removes criteria involving a graphing calculator and does not distinguish between younger and older students.</p> |
| <p>MA.6.PS.2: Reason abstractly and quantitatively.</p> | <p>Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.</p> | <p>6.7.10 Decide whether a solution is reasonable in the context of the original situation.</p> | <p>MP2 Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to <i>decontextualize</i>—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to <i>contextualize</i>, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.</p> | <p>IAS 2014 is similar to common core, both expand upon IAS 2000 by having the student decontextualize problems and develop quantitative reasoning.</p> |



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| MA.6.PS.3: Construct viable arguments and critique the reasoning of others. | Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They analyze situations by breaking them into cases and recognize and use counterexamples. They organize their mathematical thinking, justify their conclusions and communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. They justify whether a given statement is true always, sometimes, or never. Mathematically proficient students participate and collaborate in a mathematics community. They listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments. | 6.7.2 Make and justify mathematical conjectures based on a general description of a mathematical question or problem. 6.7.5 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work. 6.7.11 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems. | MP3 Construct viable arguments and critique the reasoning of others. Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments. | IAS 2014 is similar to common core, both expand upon IAS 2000 by having students construct arguments , use counterexamples, and critique others arguments. IAS 2014 does not distinguish between younger and older students. |
| MA.6.PS.4: Model with mathematics. | Mathematically proficient students apply the mathematics they know to solve problems arising in everyday life, society, and the workplace using a variety of appropriate strategies. They create and use a variety of representations to solve problems and to organize and communicate mathematical ideas. Mathematically proficient students apply what they know and are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose. | 6.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. 6.7.3 Decide when and how to break a problem into simpler parts. 6.7.4 Apply strategies and results from simpler problems to solve more complex problems. 6.7.7 Select and apply appropriate methods for estimating results of rational-number computations. 6.7.10 Decide whether a solution is reasonable in the context of the original situation. 6.7.11 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems. | MP4 Model with mathematics. Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose. | IAS 2014 does not distinguish between younger and older students. |



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| MA.6.PS.5: Use appropriate tools strategically. | Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Mathematically proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. Mathematically proficient students identify relevant external mathematical resources, such as digital content, and use them to pose or solve problems. They use technological tools to explore and deepen their understanding of concepts and to support the development of learning mathematics. They use technology to contribute to concept development, simulation, representation, reasoning, communication and problem solving. | 6.7.8 Use graphing to estimate solutions and check the estimates with analytic approaches. | MP5 Use appropriate tools strategically. Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts. | IAS 2014 does not distinguish between younger and older students. Both IAS 2014 and CCSS expand upon IAS 2000 by having students consider more than just graphing. |
| MA.6.PS.6: Attend to precision. | Mathematically proficient students communicate precisely to others. They use clear definitions, including correct mathematical language, in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They express solutions clearly and logically by using the appropriate mathematical terms and notation. They specify units of measure and label axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently and check the validity of their results in the context of the problem. They express numerical answers with a degree of precision appropriate for the problem context. | 6.7.5 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work. 6.7.6 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy. 6.7.9 Make precise calculations and check the validity of the results in the context of the problem. | MP6 Attend to precision. Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions. | IAS 2014 does not distinguish between younger and older students. |
| MA.6.PS.7: Look for and make use of structure. | Mathematically proficient students look closely to discern a pattern or structure. They step back for an overview and shift perspective. They recognize and use properties of operations and equality. They organize and classify geometric shapes based on their attributes. They see expressions, equations, and geometric figures as single objects or as being composed of several objects. | 6.7.3 Decide when and how to break a problem into simpler parts. | MP7 Look for and make use of structure. Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y . | IAS 2014 has removed examples and does not distinguish between younger and older students. Both IAS 2014 and CCSS expand upon IAS 2000 by having students discern patterns, structure, geometric figures, and composition of objects. |



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| MA.6.PS.8: Look for and express regularity in repeated reasoning. | Mathematically proficient students notice if calculations are repeated and look for general methods and shortcuts. They notice regularity in mathematical problems and their work to create a rule or formula. Mathematically proficient students maintain oversight of the process, while attending to the details as they solve a problem. They continually evaluate the reasonableness of their intermediate results. | | MP8 Look for and express regularity in repeated reasoning. Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results. | IAS 2014 has removed examples and does not distinguish between younger and older students. |
| Number Sense | | | | |
| MA.6.NS.1: | Understand that positive and negative numbers are used to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge). Use positive and negative numbers to represent and compare quantities in real-world contexts, explaining the meaning of 0 in each situation. | 6.1.1: Understand and apply the basic concept of negative numbers (e.g., on a number line, in counting, in temperature, in "owing"). | 6.NS.C.5 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. | |
| MA.6.NS.2: | Understand the integer number system. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself (e.g., $-(-3) = 3$), and that 0 is its own opposite. | | 6.NS.C.6.A Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., $-(-3) = 3$, and that 0 is its own opposite. | IAS 2014 expects students to understand the integer number system. |
| MA.6.NS.3: | Compare and order rational numbers and plot them on a number line. Write, interpret, and explain statements of order for rational numbers in real-world contexts. | 6.1.3: Compare and represent on a number line positive and negative integers, fractions, decimals (to hundredths), and mixed numbers. | 6.NS.C.6 Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. 6.NS.C.7 Understand ordering and absolute value of rational numbers. 6.NS.C.7.A Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. 6.NS.C.7.B Write, interpret, and explain statements of order for rational numbers in real-world contexts. | IAS 2014 expects students to apply in real world contexts and has removed criteria from CCSS for plotting on a coordinate plane and interpreting inequalities. |
| MA.6.NS.4: | Understand that the absolute value of a number is the distance from zero on a number line. Find the absolute value of real numbers and know that the distance between two numbers on the number line is the absolute value of their difference. Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. | 6.1.2: Interpret the absolute value of a number as the distance from zero on a number line and find the absolute value of real numbers. | 6.NS.C.7 Understand ordering and absolute value of rational numbers. 6.NS.C.7.C Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. 6.NS.C.7.D Distinguish comparisons of absolute value from statements about order. | IAS 2014 brings up the concept of magnitude and application in real world contexts. |
| MA.6.NS.5: | Know commonly used fractions (halves, thirds, fourths, fifths, eighths, tenths) and their decimal and percent equivalents. Convert between any two representations (fractions, decimals, percents) of positive rational numbers without the use of a calculator. | 6.1.4: Convert between any two representations of numbers (fractions, decimals, and percents) without the use of a calculator. 6.1.5: Recognize decimal equivalents for commonly used fractions without the use of a calculator. 7.1.7 Convert terminating decimals into reduced fractions. | 7.NS.A.2.D Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. | Both IAS 2014 and 2000 remove criteria for long division. IAS 2014 does not mention terminating decimals. |
| MA.6.NS.6: | Identify and explain prime and composite numbers. | 5.1.6: Describe and identify prime and composite numbers. | | |



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| MA.6.NS.7: | Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers from 1 to 100, with a common factor as a multiple of a sum of two whole numbers with no common factor. | 6.1.7: Find the least common multiple* and the greatest common factor* of whole numbers. Use them to solve problems with fractions (e.g., to find a common denominator to add two fractions or to find the reduced form for a fraction). | 6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use 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. | IAS 2014 and CCSS have added constraints that IAS 2000 does not have. |
| MA.6.NS.8: | Interpret, model, and use ratios to show the relative sizes of two quantities. Describe how a ratio shows the relationship between two quantities. Use the following notations: a/b, a to b, a:b. | 6.1.6: Use models to represent ratios. 6.2.6 Interpret and use ratios to show the relative sizes of two quantities. Use the notations: a/b, a to b, a:b. | 6.RP.A.1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. | Both IAS 2014 and 2000 go further than CCSS by having the student interpret and model ratios. |
| MA.6.NS.9: | Understand the concept of a unit rate and use terms related to rate in the context of a ratio relationship. | | 6.RP.A.2 Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. | |
| MA.6.NS.10 | Use reasoning involving rates and ratios to model real-world and other mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations). | | 6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. 6.RP.A.3.A Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. 6.RP.A.3.B Solve unit rate problems including those involving unit pricing and constant speed. | IAS 2014 does not have the student plot pairs on the coordinate plane and does not specify the unit rate problems. |
| Computation | | | | |
| MA.6.C.1: | Divide multi-digit whole numbers fluently using a standard algorithmic approach. | | 6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm. | |
| MA.6.C.2: | Compute with positive fractions and positive decimals fluently using a standard algorithmic approach. | 6.2.3 Multiply and divide decimals. | 6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. | |
| MA.6.C.3: | Solve real-world problems with positive fractions and decimals by using one or two operations. | 6.2.5 Solve problems involving addition, subtraction, multiplication, and division of positive fractions and explain why a particular operation was used for a given situation. 6.5.10 Add, subtract, multiply, and divide with money in decimal notation. | | IAS 2014 removes criteria involving explaining a particular operation and does not specify money alone. |
| MA.6.C.4: | Compute quotients of positive fractions and solve real-world problems involving division of fractions by fractions. Use a visual fraction model and/or equation to represent these calculations. | | 6.NS.A.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. | |
| MA.6.C.5: | Evaluate positive rational numbers with whole number exponents. | 7.1.4 Understand and compute whole number powers of whole numbers. | 6.EE.A.1 Write and evaluate numerical expressions involving whole number exponents. | |
| MA.6.C.6: | Apply the order of operations and properties of operations (identity, inverse, commutative properties of addition and multiplication, associative properties of addition and multiplication, and distributive property) to evaluate numerical expressions with nonnegative rational numbers, including those using grouping symbols, such as parentheses, and involving whole number exponents. Justify each step in the process. | 6.3.6 Apply the correct order of operations and the properties of real numbers (e.g., identity, inverse, commutative*, associative*, and distributive* properties) to evaluate numerical expressions. Justify each step in the process. | | |
| Algebra and Functions | | | | |
| MA.6.AF.1: | Evaluate expressions for specific values of their variables, including expressions with whole-number exponents and those that arise from formulas used in real-world problems. | 8.3.4 Use the correct order of operations to find the values of algebraic expressions involving powers. | 6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. 6.EE.A.2.C Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). | IAS 2014 and CCSS expects students to use formulas to solve real world problems, IAS 2014 does not specify using order of operations. |



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| MA.6.AF.2: | Apply the properties of operations (e.g., identity, inverse, commutative, associative, distributive properties) to create equivalent linear expressions and to justify whether two linear expressions are equivalent when the two expressions name the same number regardless of which value is substituted into them. | 7.3.4 Evaluate numerical expressions and simplify algebraic expressions by applying the correct order of operations and the properties of rational numbers (e.g., identity, inverse, commutative, associative, distributive properties). Justify each step in the process. | 6.EE.A.3 Apply the properties of operations to generate equivalent expressions. 6.EE.A.4 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). | |
| MA.6.AF.3: | Define and use multiple variables when writing expressions to represent real-world and other mathematical problems, and evaluate them for given values. | 6.3.2 Write and use formulas with up to three variables to solve problems. 6.3.5 Use variables in expressions describing geometric quantities. | 6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. 6.EE.A.2.A Write expressions that record operations with numbers and with letters standing for numbers. 6.EE.A.2.B Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. 6.EE.B.6 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. | IAS 2014 has removed specific criteria for geometric quantities, limiting to three variables, and use of specific terms included in IAS 2000 and CCSS. |
| MA.6.AF.4: | Understand that solving an equation or inequality is the process of answering the following question: Which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | | 6.EE.B.5 Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true. | |
| MA.6.AF.5: | Solve equations of the form $x + p = q$, $x - p = q$, $px = q$, and $x/p = q$ fluently for cases in which p , q and x are all nonnegative rational numbers. Represent real world problems using equations of these forms and solve such problems. | 6.3.1 Write and solve one-step linear equations and inequalities in one variable and check the answers. | 6.EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p , q and x are all nonnegative rational numbers. | IAS 2014 and CCSS define the form of equation students are solving. |
| MA.6.AF.6: | Write an inequality of the form $x > c$, $x \geq c$, $x < c$, or $x \leq c$, where c is a rational number, to represent a constraint or condition in a real-world or other mathematical problem. Recognize inequalities have infinitely many solutions and represent solutions on a number line diagram. | | 6.EE.B.8 Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. | |
| MA.6.AF.7: | Understand that signs of numbers in ordered pairs indicate the quadrant containing the point; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. Graph points with rational number coordinates on a coordinate plane. | 6.3.7 Identify and graph ordered pairs in the four quadrants of the coordinate plane. | 6.NS.C.6.B Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. 6.NS.C.6.C Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. | IAS 2014 and CCSS expand upon IAS 2000 by have students identify reflections and differences in signs. |
| MA.6.AF.8: | Solve real-world and other mathematical problems by graphing points with rational number coordinates on a coordinate plane. Include the use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. | 5.3.6: Understand that the length of a horizontal line segment on a coordinate plane equals the difference between the x-coordinates and that the length of a vertical line segment on a coordinate plane equals the difference between the y-coordinates. | 6.NS.C.8 Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. | |
| MA.6.AF.9: | Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. | | 6.RP.A.3.A Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. | |



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| MA.6.AF.10 | Use variables to represent two quantities in a proportional relationship in a real-world problem; write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. | 6.3.8 Solve problems involving linear functions with integer* values. Write the equation and graph the resulting ordered pairs of integers on a grid. 6.3.9 Investigate how a change in one variable relates to a change in a second variable. | 6.EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation $d = 65t$ to represent the relationship between distance and time. | IAS 2014 and CCSS expand upon IAS 2000 by having students express equations in terms of independent and dependent variables in a real world context. |
| Geometry and Measurement | | | | |
| MA.6.GM.1: | Convert between measurement systems (English to metric and metric to English) given conversion factors, and use these conversions in solving real-world problems. | 6.5.1 Select and apply appropriate standard units and tools to measure length, area, volume, weight, time, temperature, and the size of angles. 6.5.2 Understand and use larger units for measuring length by comparing miles to yards and kilometers to meters. 6.5.3 Understand and use larger units for measuring area by comparing acres and square miles to square yards and square kilometers to square meters. 7.5.1 Compare lengths, areas, volumes, weights, capacities, times, and temperatures within measurement systems. 8.5.1 Convert common measurements for length, area, volume, weight, capacity, and time to equivalent measurements within the same system. | 6.RP.A.3.D Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. | IAS 2000 provides additional details about when to convert between measurement systems. CCSS expects students to use rate reasoning. |
| MA.6.GM.2: | Know that the sum of the interior angles of any triangle is 180° and that the sum of the interior angles of any quadrilateral is 360° . Use this information to solve real-world and mathematical problems. | 6.4.4 Understand that the sum of the interior angles of any triangle is 180° and that the sum of the interior angles of any quadrilateral is 360° . Use this information to solve problems. | | |
| MA.6.GM.3: | Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate; apply these techniques to solve real-world and other mathematical problems. | 6.4.3 Draw quadrilaterals and triangles from given information about them. 7.4.1 Understand coordinate graphs and use them to plot simple shapes, find lengths and areas related to the shapes, and find images under translations (slides), rotations (turns), and reflections (flips). | 6.G.A.3 Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems. | |
| MA.6.GM.4: | Find the area of complex shapes composed of polygons by composing or decomposing into simple shapes; apply this technique to solve real-world and other mathematical problems. | 7.5.5 Estimate and compute the area of more complex or irregular two-dimensional shapes by dividing them into more basic shapes. 8.5.5 Estimate and compute the area of irregular two-dimensional shapes and the volume of irregular three-dimensional objects by breaking them down into more basic geometric objects. | 6.G.A.1 Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems. 7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms. | IAS 2014 does not limit what figures students are finding the area. |
| MA.6.GM.5: | Find the volume of a right rectangular prism with fractional edge lengths using unit cubes of the appropriate unit fraction edge lengths (e.g., using technology or concrete materials), and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths to solve real-world and other mathematical problems. | 6.5.8 Use strategies to find the surface area and volume of right prisms* and cylinders using appropriate units. 7.5.4 Use formulas for finding the perimeter and area of basic two-dimensional shapes and the surface area and volume of basic three-dimensional shapes, including rectangles, parallelograms, trapezoids, triangles, circles, right prisms, and cylinders. | 6.G.A.2 Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. | |



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| MA.6.GM.6: | Construct right rectangular prisms from nets and use the nets to compute the surface area of prisms; apply this technique to solve real-world and other mathematical problems. | 6.5.7 Construct a cube and rectangular box from two-dimensional patterns and use these patterns to compute the surface area of these objects. 6.5.8 Use strategies to find the surface area and volume of right prisms* and cylinders using appropriate units. 4.4.6: Construct cubes and prisms and describe their attributes. | 6.G.A.4 Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems. | |
| Data Analysis and Statistics | | | | |
| MA.6.DS.1: | Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for the variability in the answers. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. | | 6.SP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. 6.SP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. | |
| MA.6.DS.2: | Select, create, and interpret graphical representations of numerical data, including line plots, histograms, and box plots. | 6.6.2 Make frequency tables for numerical data, grouping the data in different ways to investigate how different groupings describe the data. Understand and find relative and cumulative frequency for a data set. Use histograms of the data and of the relative frequency distribution, and a broken line graph for cumulative frequency, to interpret the data. 7.6.1 Analyze, interpret, and display data in appropriate bar, line, and circle graphs and stem-and-leaf plots and justify the choice of display. 7.6.2 Make predictions from statistical data. 8.6.4 Analyze, interpret, and display single- and two-variable data in appropriate bar, line, and circle graphs; stem-and-leaf plots; and box-and-whisker plots and explain which types of display are appropriate for various data sets. | 6.SP.A.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots. | IAS 2014 has removed criteria for making predictions from statistical data and analyzing single and two variable data. |
| MA.6.DS.3: | Formulate statistical questions; collect and organize the data (e.g., using technology); display and interpret the data with graphical representations (e.g., using technology). | 7.6.2 Make predictions from statistical data. | | IAS 2014 has expanded upon IAS 2000 to have student form questions and organize data. |
| MA.6.DS.4: | Summarize numerical data sets in relation to their context in multiple ways, such as: report the number of observations; describe the nature of the attribute under investigation, including how it was measured and its units of measurement; determine quantitative measures of center (mean and/or median) and spread (range and interquartile range), as well as describe any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered; and relate the choice of measures of center and spread to the shape of the data distribution and the context in which the data were gathered. | 6.6.3 Compare the mean, median, and mode for a set of data and explain which measure is most appropriate in a given context. | 6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: 6.SP.B.5.A Reporting the number of observations. 6.SP.B.5.B Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 6.SP.B.5.C Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. 6.SP.B.5.D Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered. | |
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| | | 6.4.7 Visualize and draw two-dimensional views of three-dimensional objects made from rectangular solids. | 6.SP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. | |



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| | | 6.5.6 Understand the concept of significant figures and round answers to an appropriate number of significant figures. 6.5.9 Use a formula to convert temperatures between Celsius and Fahrenheit. 6.2.9 Use estimation to decide whether answers are reasonable in decimal problems. 6.2.10 Use mental arithmetic to add or subtract simple fractions and decimals. 8.5.2 Solve simple problems involving rates and derived measurements for attributes such as velocity and density. | | |