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STATE OF NEW JERSEY
DEPARTMENT OF EDUCATION

Grade 6: New Jersey Student Learning Standards for Mathematics - Prerequisite Standards and Learning Objectives by Domain

Description

Included here are the prerequisite concepts and skills necessary for students to learn grade level content based on the New Jersey Student Learning Standards in mathematics. This tool is intended to support educators in the identification of any gaps in conceptual understanding or skill that might exist in a student's understanding of mathematics standards. The organization of this document mirrors that of the New Jersey Student Learning Standards for mathematics, includes all grade- or course-level standards and the associated student learning objectives, and reflects a grouping of the standards by domain.

The tables are divided into three columns. The first column contains the grade level standard and student learning objectives, which reflect the corresponding concepts and skills in that standard. The second column contains standards from prior grades and the corresponding learning objectives, which reflect prerequisite concepts and skills essential for student attainment of the grade level standard as listed on the left. Given that a single standard may reflect multiple concepts and skills, all learning objectives for a prior grade standard may not be listed. Only those prior grade learning objectives that reflect prerequisite concepts and skills important for attainment of the associated grade level standard is listed. The third column contains the recommendations from Student Achievement Partners' recommendations (SAP) for the 2020-21 school year regarding preserving or reducing time as compared to a typical academic year.

Content Emphases Key: ■: Major Cluster ▢: Supporting Cluster ◎: Additional Cluster

Note: Double asterisks (**) indicate that the example(s) included within the New Jersey Student Learning Standard may be especially informative when considering the Student Learning Objective.

Grade 6: New Jersey Student Learning Standards for Mathematics - Prerequisite Standards and Learning Objectives

Domain: Ratios and Proportional Relationships

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.RP.A.1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example,* "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." We are learning to/that… ▪ explain the concept of a ratio through definition ▪ use ratio language to describe a relationship between two quantities	**5.NF.B.5** Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. We have learned to/that… ▪ interpret multiplication as scaling (resizing) by comparing the size of a product to the size of one factor without performing the multiplication	For curricula and lessons that are well aligned to understanding ratio concepts and using ratio reasoning to solve problems as detailed in this cluster of standards (6.RP.A), *no special considerations* for shifting how time is dedicated are recommended. *Time* spent on instruction and practice should **not** be reduced.
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. *For example*, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger. We are learning to/that… ▪ construct a unit rate (a/b) from a given ratio (a:b) ▪ explain a unit rate (a/b) associated with a ratio (a:b) ▪ express a ratio relationship using rate language	**5.NF.B.3** Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. We have learned to/that… ▪ interpret a fraction as division of the numerator by the denominator using visual fraction models or equations	For curricula and lessons that are well aligned to understanding ratio concepts and using ratio reasoning to solve problems as detailed in this cluster of standards (6.RP.A), *no special considerations* for shifting how time is dedicated are recommended. *Time* spent on instruction and practice should **not** be reduced.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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. 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. b. Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed? c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities. We are learning to/that… ▪ represent and solve rate and ratio real-world and mathematical problems by	**5.OA.B.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example*, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so. We have learned to/that … ▪ generate two numerical patterns using two given rules and identify relationships between corresponding terms in the patterns ▪ form ordered pairs consisting of corresponding terms from the two patterns and graph the ordered pairs on a coordinate plane **4.MD.A.1** Know relative sizes of measurement units within one system of units including km, m, cm. mm; kg, g; lb, oz.; *l*, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	For curricula and lessons that are well aligned to understanding ratio concepts and using ratio reasoning to solve problems as detailed in this cluster of standards (6.RP.A), *no special considerations* for shifting how time is dedicated are recommended. *Time* spent on instruction and practice should **not** be reduced.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
using tables, tape diagrams, double number line diagrams, and equations ▪ create tables of equivalent ratios and find missing values with whole number measurements ▪ plot pairs of values, in the coordinate plane, from a ratio table to compare ratios ▪ solve unit rate problems, including unit pricing and constant speed ▪ find the part, whole, and percent of a quantity in real-world problems ▪ unit ratios can be used to manipulate and transform units accurately ▪ convert measurement units utilizing ratio reasoning	*For example*, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ... We have learned to/that… ▪ express measurements in larger units in terms of a smaller unit within a single system of measurement ▪ record measurement equivalents in a two-column table**	

Grade 6: New Jersey Student Learning Standards for Mathematics - Prerequisite Standards and Learning Objectives

Domain: The Number System

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations SAP recommendation to preserve or reduce time in 20-21 as compared to a typical year
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. *For example*, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (*a*/*b*) ÷ (*c*/*d*) = *ad*/*bc*). How much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 3/4- cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi? We are learning to/that… ▪ compute quotients of fractions ▪ interpret quotients of fractions ▪ solve word problems involving division of fractions by fractions using visual models and equations	**5.NF.B.7** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example*, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3. b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example*, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4. We have learned to/that… ▪ compute and interpret the quotients of a unit fraction and a non-zero whole number ** ▪ compute and interpret the quotients of a non-zero whole number and a unit fraction **	*Incorporate* foundational work on division with unit fractions and whole numbers (5.NF.B.7) in the early part of students' work on fraction division (6.NS.A).

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
	5.NF.B.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction We have learned to/that… ▪ apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction	
6.NS.B.2. Fluently divide multi-digit numbers using the standard algorithm. We are learning to/that… ▪ divide multi-digit numbers using the standard algorithm working towards accuracy and efficiency	**5.NBT.B.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. We have learned to/that… ▪ find whole-number quotients with up to four-digit dividends and two-digit divisors using strategies based on place value	For 6.NS.B.2 and 6.NS.B.3, *integrate* problems into practice throughout the year, *eliminating* lessons on computing fluently. To keep students on track to algebra and avoid inequitable remediation structures, time in grade 6 should not be spent remediating multi-digit calculation algorithms.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. We are learning to/that… ▪ add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation, working towards accuracy and efficiency	**5.NBT.B.7** Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. We have learned to/that… ▪ add and subtract decimals to hundredths using strategies based on place value ▪ multiply decimals to hundredths using strategies based on place value ▪ divide decimals to hundredths using strategies based on place value	For 6.NS.B.2 and 6.NS.B.3, *integrate* problems into practice throughout the year, *eliminating* lessons on computing fluently. To keep students on track to algebra and avoid inequitable remediation structures, time in grade 6 should not be spent remediating multi-digit calculation algorithms.
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. *For example,* express 36 + 8 as 4 (9 + 2). We are learning to/that… ▪ find the greatest common factor of two whole numbers that are less than or equal to 100	**4.OA.B.4** Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite. We have learned to/that… ▪ find all factors pairs for a whole number in the range 1 through 100.	For curricula and lessons that are well aligned to common factors and multiples, including using distributive property for expressions as detailed in this standard, *no special considerations* for shifting how time is dedicated are recommended. Time spent on instruction and practice should **not** be reduced.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
▪ find the least common multiple of two whole numbers that are less than or equal to 12 ▪ use the distributive property to factor the greatest common factor from a sum of two whole numbers in the range 1 to 100	▪ determine whether a given whole number is a multiple of a given one-digit number in the range 1 through 100	
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. We are learning to/that… ▪ positive and negative numbers are used together to describe quantities having opposite directions or values** ▪ represent quantities in real-world contexts using positive and negative numbers ▪ explain the meaning of zero in the context of real-world situations using positive and negative numbers	n/a	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. 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. We are learning to/that… ▪ locate numbers with opposite signs as points on opposite sides of zero on the number line ▪ the opposite of an opposite of a number is the number itself and that zero is its own opposite	**5.G.A.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate). We have learned to/that… ▪ a coordinate system is defined by a pair of perpendicular lines called axes with the intersection of the lines, the origin, occurring at 0 on each line ▪ a given point in the coordinate plane is located using an ordered pair of numbers called coordinates ▪ the first number in an ordered pair indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis.	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
	▪ the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate)	
6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. 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. We are learning to/that… ▪ the signs of an ordered pair indicate its quadrant location in the coordinate plane ▪ ordered pairs that differ only by signs are reflections across one or both axes	**5.G.A.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate). We have learned to/that… ▪ a coordinate system is defined by a pair of perpendicular lines called axes with the intersection of the lines, the origin, occurring at 0 on each line ▪ a given point in the coordinate plane is located using an ordered pair of numbers called coordinates ▪ the first number in an ordered pair indicates how far to travel from the origin in the direction of one axis, and	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
	the second number indicates how far to travel in the direction of the second axis. ▪ the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate)	
6.NS.C.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. 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. We are learning to/that… ▪ find and position integers and other rational numbers on a horizontal or vertical number line ▪ find and plot pairs of integers and other rational numbers on the coordinate plane	**4.NF.A.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or < . We have learned to/that… ▪ recognize that, when comparing two fractions, they must refer to the same whole ▪ record the results of comparison with symbols >, =, or <, ▪ compare two fractions with different numerators and different denominators by comparing to benchmark fraction such as ½ ▪ compare two fractions with different numerators and different denominators by creating common denominators and numerators	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
	3.NF.A.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line. b. Represent a fraction *a*/*b* on a number line diagram by marking off a lengths 1/*b* from 0. Recognize that the resulting interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line. We have learned to/that… ▪ fractions are numbers and can be found or represented on the number line ▪ represent and recognize a fraction *1/b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts and that the endpoint of the part based at 0 locates the number *1/b* on the number line ▪ represent and recognize a fraction *a/b* on a number line diagram by marking off a lengths *1/b* from 0 and that its endpoint locates the number *a/b* on the number line	

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.NS.C.7 Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3° C > -7° C to express the fact that -3° C is warmer than -7° C. 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. For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars. d. Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.	n/a	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
We are learning to/that… ▪ represent the relative position of two numbers on a number line diagram using inequality statements ▪ write and interpret statements of order using rational numbers to explain real-world problems ▪ absolute value of a rational number is its distance from zero on the number line ▪ express the magnitude of a positive or negative quantity in a real-world situation using absolute value ▪ statements about order are used to distinguish comparisons of absolute value		
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. We are learning to/that… ▪ use coordinates and absolute value to find distances between points, with the same first coordinates or same second coordinates, in the four quadrants to solve real-world and mathematical problems	**5.G.A.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. We have learned to/that… ▪ represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane ▪ interpret coordinate values of points in the context of the real world and mathematical problems	*Incorporate* foundational work on the coordinate plane (5.G.A.1) to support students' entry into this cluster.

Grade 6: New Jersey Student Learning Standards for Mathematics - Prerequisite Standards and Learning Objectives

Domain: Expressions and Equations

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.EE.A.1. Write and evaluate numerical expressions involving whole-number exponents. We are learning to/that… ▪ write a numerical expression using whole-number exponents ▪ evaluate numerical expressions involving whole number exponents	**5.NBT.A.2** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. We have learned to/that… ▪ denote powers of 10 by using whole-number exponents	n/a
6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example,* express the calculation "Subtract y from 5" as $5 - y$. We are learning to/that… ▪ write an algebraic expression from a verbal description that includes operations, numbers, and variables	**5.OA.A.2** Write simple expressions that record calculations with numbers and interpret numerical expressions without evaluating them. *For example,* express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$, without having to calculate the indicated sum or product. We have learned to/that… ▪ write simple numerical expressions from a description that record calculations with numbers.	n/a

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. 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. *For example*, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms. We are learning to/that… ▪ 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	n/a	n/a
6.EE.A.2 Write, read, and evaluate expressions in which letters stand for numbers. 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). *For example*, use the	**5.OA.B.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example*, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the	n/a

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
formulas $V = s^3$ and $A = 6s^2$ to find the volume and surface area of a cube with sides of length $s = ½$. We are learning to/that… ▪ evaluate expressions, including formulas, for specific values of the variables ▪ perform arithmetic operations, utilizing the Order of Operations, that include whole number exponents and no parentheses	corresponding terms in the other sequence. Explain informally why this is so. We have learned to/that… ▪ generate two numerical patterns using two given rules and identify relationships between corresponding terms in the patterns	
6.EE.A.3 Apply the properties of operations to generate equivalent expressions. *For example*, apply the distributive property to the expression $3(2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression 24x + 18y to produce the equivalent expression $6(4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$. We are learning to/that… ▪ generate equivalent expressions using the properties of operations	**3.OA.B.5** Apply properties of operations as strategies to multiply and divide. *Examples:* If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property) We have learned to/that… ▪ apply properties of operations (commutative property) as strategies to multiply.	*Emphasize* equivalent expressions (6.EE.A.3 and 6.EE.A.4), particularly the idea that applying properties of operations to an expression always results in an expression that is equivalent to the original one.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
	▪ apply properties of operations (associative property) as strategies to multiply. ▪ apply properties of operations (distributive property) as strategies to multiply.	
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). *For example*, the expressions $y + y + y$ and $3y$ are equivalent because they name the same number regardless of which number y stands for. We are learning to/that… ▪ two expressions are equivalent when they name the same number regardless of which value is substituted into them ▪ identify when two expressions are equivalent	n/a	*Emphasize* equivalent expressions (6.EE.A.3 and 6.EE.A.4), particularly the idea that applying properties of operations to an expression always results in an expression that is equivalent to the original one.
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.	n/a	For curricula and lessons that are well aligned to reasoning about and solving one-variable equations and inequalities as detailed in this cluster, *no special considerations* for shifting how time is dedicated are recommended.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
We are learning to/that… ▪ determine if a given number from a specified set is a solution to an equation or an inequality using substitution		Time spent on instruction and practice should **not** be reduced.
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. We are learning to/that… ▪ variables are used to represent unknown numbers, including any number in a specified set ▪ write expressions using variables to represent real-world or mathematical situations	n/a	For curricula and lessons that are well aligned to reasoning about and solving one-variable equations and inequalities as detailed in this cluster, *no special considerations* for shifting how time is dedicated are recommended. Time spent on instruction and practice should **not** be reduced.
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. We are learning to/that… ▪ write and solve equations of the form $x + p = q$ and $px = q$, where p, q, and x are	**5.NF.A.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example*, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, $a/b + c/d = (ad + bc)/bd$.) We have learned to/that…	For curricula and lessons that are well aligned to reasoning about and solving one-variable equations and inequalities as detailed in this cluster, *no special considerations* for shifting how time is dedicated are recommended. Time spent on instruction and practice should **not** be reduced.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
all nonnegative rational numbers, for real-world and mathematical problems	▪ add and subtract fractions with unlike denominators, including mixed numbers, by replacing given fractions with equivalent fraction. **5.NF.B.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. *For example*, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.) We have learned to/that… ▪ apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. ▪ interpret the product of a fraction and a fraction as $(a/b) \times (c/d) = ac/bd$ ** **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.	

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	We have learned to/that… ▪ compute quotients of fractions ▪ interpret quotients of fractions	
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. We are learning to/that… ▪ represent a constraint or condition in a real-world or mathematical problem by writing an inequality in the form $x > c$ or $x < c$ ▪ inequalities of the form $x > c$ or $x < c$ have infinitely many solutions ▪ represent the infinitely many solutions to the inequalities $x > c$ or $x < c$ on a number line diagram	n/a	For curricula and lessons that are well aligned to reasoning about and solving one-variable equations and inequalities as detailed in this cluster, *no special considerations* for shifting how time is dedicated are recommended. Time spent on instruction and practice should **not** be reduced.
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	**5.OA.A.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example*, express the calculation "add 8 and 7, then multiply by 2" as $2 \times (8 + 7)$. Recognize that $3 \times (18932 + 921)$ is three times as large as $18932 + 921$,	For curricula and lessons that are well aligned to representing and analyzing quantitative relationships between dependent and independent variables as detailed in this cluster, *no special considerations* for shifting how time is dedicated are recommended.

Standard and Student Learning Objectives	**Previous Grade(s) Standards and Student Learning Objectives**	**Instructional Considerations** *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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. We are learning to/that… ▪ two quantities which change in relationship to one another are expressed as independent and dependent variables ▪ write an equation using two quantities, an independent and a dependent variable, to represent a real-world problem ▪ analyze the relationship between the dependent and independent variables using graphs and tables and relate them to the equation	without having to calculate the indicated sum or product. We have learned to/that… ▪ write simple numerical expressions from a description that record calculations with numbers.	*Time* spent on instruction and practice should **not** be reduced.

Grade 6: New Jersey Student Learning Standards for Mathematics - Prerequisite Standards and Learning Objectives

Domain: Geometry

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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 We are learning to/that… ▪ find the area of right triangles and other triangles by composing into rectangles ▪ find the area of special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes ▪ apply the techniques of finding area of polygons by composition or decomposition to solve real-world and mathematical problems	**4.MD.A.3** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example*, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor. We have learned to/that… ▪ apply the area formula for rectangles in real world and mathematical problems. **3.MD.C.7** Relate area to the operations of multiplication and addition. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems. We have learned to/that… ▪ recognize area as additive by finding areas of rectilinear figures. ** ▪ decompose rectilinear figures into non-overlapping rectangles and find their areas to solve real world problems.	*Emphasize* understanding of the reasoning leading to the triangle area formula. Instead of teaching additional area formulas as separate topics, *emphasize* problems that focus on finding areas in real-world problems by decomposing figures into triangles and rectangles.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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 $V = l\ w\ h$ and $V = B\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. We are learning to/that… ▪ we can find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes ▪ show that volume of a right rectangular prism is the same when multiplying edge lengths or packing it with unit cubes ▪ find volumes of right rectangular prisms with fractional edge lengths applying the volume formulas $V = l\ w\ h$ and $V = B\ h$ in real-world or mathematical problems	**5.MD.C.5** Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world & mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems. We have learned to/that… ▪ find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes and show	*Incorporate* foundational work on volume (5.MD.C) while working on volumes of right rectangular prisms with fractional edge lengths (6.G.A.2). *Emphasize* contextual problems, as detailed in the second sentence of the standard.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
	that the volume is the same as would be found by multiplying the edge lengths. ▪ represent volumes as the product of three whole numbers. ▪ apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.	
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. We are learning to/that… ▪ draw polygons in the coordinate plane given coordinates of the vertices ▪ find the length of a side of a polygon using coordinates with the same first coordinate or the same second coordinate ▪ apply the technique of finding the length of a side of a polygon to solve real-world and mathematical problems in the coordinate plane	**5.G.A.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. We have learned to/that… ▪ represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane ▪ interpret coordinate values of points in the context of the real world and mathematical problems	*Limit* lessons and problems involving polygons on the coordinate plane.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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. We are learning to/that… ▪ represent three-dimensional figures made up of rectangles and triangles by using nets ▪ use the net to find the surface area of three-dimensional figures made up of rectangles and triangles ▪ solve real-world and mathematical problems by using nets to find surface area applying net surface area techniques	n/a	*Limit* lessons and problems on constructing three-dimensional figures from nets and determining if nets can be constructed into three-dimensional figures during the study of nets and surface area.

Grade 6: New Jersey Student Learning Standards for Mathematics - Prerequisite Standards and Learning Objectives

Domain: Statistics and Probability

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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. *For example*, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages. We are learning to/that… ▪ a statistical question is one that anticipates variability in the data related to the question and accounts for it in the answers ▪ recognize statistical questions	n/a	*Combine* lessons about introductory statistical concepts so as to proceed more quickly to applying and reinforcing these concepts in context. Note that there are no procedural expectations in the cluster; no procedural practice is required to meet the expectations of the cluster.
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. We are learning to/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	n/a	*Combine* lessons about introductory statistical concepts so as to proceed more quickly to applying and reinforcing these concepts in context. Note that there are no procedural expectations in the cluster; no procedural practice is required to meet the expectations of the cluster.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
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. We are learning to/that… ▪ a measure of center (mean and median) for a numerical data set summarizes all of its values with a single number ▪ a measure of variation (interquartile range and mean absolute deviation) describes how its values vary with a single number	n/a	*Combine* lessons about introductory statistical concepts so as to proceed more quickly to applying and reinforcing these concepts in context. Note that there are no procedural expectations in the cluster; no procedural practice is required to meet the expectations of the cluster.
6.SP.B.4 Display numerical data in plots on a number line, including dot plots, histograms, and box plots. We are learning to/that… ▪ display numerical data in plots on a number line, including dot plots, histograms, and box plots	**5.MD.B.2** Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example*, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally. We have learned to/that… ▪ make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8)	*Reduce* the amount of required student practice in calculating measures of center and measures of variation by hand to make room to emphasize the concept of distribution and the usefulness of summary measures. *Reduce* the amount of time spent creating data displays by hand.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
6.SP.B.5 Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. 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. 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. We are learning to/that… ▪ summarize numerical data sets in relation to their context, such as by reporting the number of observations and describing how it was measured and the units for the measurement ▪ describe overall patterns and any striking deviations from a data set by giving the measures of center (median and/or mean) and variability (interquartile range and/or mean	n/a	*Reduce* the amount of required student practice in calculating measures of center and measures of variation by hand to make room to emphasize the concept of distribution and the usefulness of summary measures. *Reduce* the amount of time spent creating data displays by hand.

Standard and Student Learning Objectives	Previous Grade(s) Standards and Student Learning Objectives	Instructional Considerations *SAP* recommendation to preserve or reduce time in 20-21 as compared to a typical year
absolute deviation) with reference to the context with which the data was collected ▪ the shape of the data distribution and the context in which the data were gathered can be related to the choice of measures of center and variability		