

Grade 6 Mathematics *Standards of Learning* - 2023 Overview of Revisions

This overview includes a summary of the content embedded in five content strands.

Number and Number Sense: *There are multiple representations of numbers and relationships among numbers that provide meaning and structure and allow us to make sense of the world around us.*

- Express equivalency, compare, and order numbers written as fractions, mixed numbers, decimals, and percents
- Represent, compare, and order integers
- Recognize and represent patterns with exponents and perfect squares

Computation and Estimation: *Estimation and the operations of addition, subtraction, multiplication, and division, allow us to model, represent, and solve different types of problems with rational numbers.*

- Represent and solve problems using operations with fractions and mixed numbers
- Represent and solve problems using operations with integers

Measurement and Geometry: *Analyzing and describing geometric objects, the relationships and structures among them, or the space that they occupy can be used to classify, quantify, measure, or count one or more attributes.*

- Solve problems involving area and circumference of circles
- Solve problems involving the area and perimeter of triangles and parallelograms.
- Describe characteristics of the coordinate plane and graph ordered pairs
- Determine congruence of segments, angles, and polygons

Probability and Statistics: *The world can be investigated through posing questions and collecting, representing, analyzing, and interpreting data to describe and predict events and real-world phenomena.*

- Apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on circle graphs.
- Represent the mean as a balance point and describe how statistical measures are affected when a data value is added, removed, or changed

Patterns, Functions, and Algebra: *Proportional relationships can be described, and generalizations can be made using patterns, relations, and functions. Algebraic equations and inequalities can be used to represent and solve real world problems.*

- Use ratios to represent relationships between quantities
- Identify and represent proportional relationships between two quantities
- Create and solve one-step linear equations in one variable
- Represent a contextual situation using a linear inequality in one variable with symbols and graphs on a number line

Comparison of Grade 6 Mathematics *Standards of Learning* – 2016 to 2023

2016 <i>Standards of Learning</i> Essential Knowledge and Skills (EKS) Number and Number Sense * On the state assessment, items measuring this objective are assessed without the use of a calculator.	2023 <i>Standards of Learning</i> Knowledge and Skills (KS) Number and Number Sense (NS) * On the state assessment, items measuring this knowledge and skill are assessed without the use of a calculator.
<p>6.1 The student will represent relationships between quantities using ratios, and will use appropriate notations, such as $\frac{a}{b}$, a to b, and $a:b$.</p> <ul style="list-style-type: none"> ● Represent a relationship between two quantities using ratios. ● Represent a relationship in words that makes a comparison by using the notations $\frac{a}{b}$, $a:b$, and a to b. ● Create a relationship in words for a given ratio expressed symbolically. 	<p>[Moved to 6.PFA.1]</p>
<p>6.2 The student will</p> <p>a) represent and determine equivalencies among fractions, mixed numbers, decimals, and percents; * and</p> <p>b) compare and order positive rational numbers. *</p> <p>c) represent and determine equivalencies among fractions, mixed numbers, decimals, and percents; * and</p> <p>d) compare and order positive rational numbers. *</p> <ul style="list-style-type: none"> ● Represent ratios as fractions (proper or improper), mixed numbers, decimals, and/or percents. (a) ● Determine the decimal and percent equivalents for numbers written in fraction form (proper or improper) or as a mixed number, including repeating decimals. (a) 	<p>6.NS.1 The student will reason and use multiple strategies to express equivalency, compare, and order numbers written as fractions, mixed numbers, decimals, and percents.</p> <p>a) Estimate and determine the percent represented by a given model (e.g., number line, picture, verbal description), including percents greater than 100% and less than 1%.*</p> <p>b) Represent and determine equivalencies among decimals (through the thousandths place) and percents incorporating the use of number lines, and concrete and pictorial models.*</p> <p>c) Represent and determine equivalencies among fractions (proper or improper) and mixed numbers that have denominators that are 12 or less or factors of 100 and percents incorporating the use of number lines, and concrete and pictorial models.*</p>

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Number and Number Sense</p> <p style="text-align: center;">* On the state assessment, items measuring this objective are assessed without the use of a calculator.</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Number and Number Sense (NS)</p> <p style="text-align: center;">* On the state assessment, items measuring this knowledge and skill are assessed without the use of a calculator.</p>
<ul style="list-style-type: none"> ● Represent and determine equivalencies among decimals, percents, fractions (proper or improper), and mixed numbers that have denominators that are 12 or less or factors of 100. (a) ● Compare two percents using pictorial representations and symbols ($<$, \leq, \geq, $>$, $=$). (b) ● Order no more than four positive rational numbers expressed as fractions (proper or improper), mixed numbers, decimals, and percents (decimals through thousandths, fractions with denominators of 12 or less or factors of 100). Ordering may be in ascending or descending order. (b) 	<ul style="list-style-type: none"> d) Represent and determine equivalencies among decimals, percents, fractions (proper or improper), and mixed numbers that have denominators that are 12 or less or factors of 100 incorporating the use of number lines, and concrete and pictorial models.* e) Use multiple strategies (e.g., benchmarks, number line, equivalency) to compare and order no more than four positive rational numbers expressed as fractions (proper or improper), mixed numbers, decimals, and percents (decimals through thousandths, fractions with denominators of 12 or less or factors of 100) with and without models. Justify solutions orally, in writing or with a model. Ordering may be in ascending or descending order.*
<p>6.3 The student will</p> <p>a) identify and represent integers; b) compare and order integers; and c) identify and describe absolute value of integers.</p> <ul style="list-style-type: none"> ● Model integers, including models derived from practical situations. (a) ● Identify an integer represented by a point on a number line. (a) ● Compare and order integers using a number line. (b) ● Compare integers, using mathematical symbols ($<$, $>$, $=$). (b) ● Identify and describe the absolute value of an integer. (c) 	<p>6.NS.2 The student will reason and use multiple strategies to represent, compare, and order integers.</p> <ul style="list-style-type: none"> a) Represent integers (e.g., number lines, concrete materials, pictorial models), including models derived from contextual situations, and identify an integer represented by a point on a number line. b) Compare and order integers using a number line. c) Compare integers, using mathematical symbols ($<$, $>$, $=$). d) Identify and describe the absolute value of an integer as the distance from zero on the number line.
<p>6.4 The student will recognize and represent patterns with whole number exponents and perfect squares.</p>	<p>6.NS.3 The student will recognize and represent patterns with whole number exponents and perfect squares.</p>

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Number and Number Sense</p> <p align="center">* On the state assessment, items measuring this objective are assessed without the use of a calculator.</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Number and Number Sense (NS)</p> <p align="center">* On the state assessment, items measuring this knowledge and skill are assessed without the use of a calculator.</p>
<ul style="list-style-type: none"> ● Recognize and represent patterns with bases and exponents that are whole numbers. ● Recognize and represent patterns of perfect squares not to exceed 20^2, by using grid paper, square tiles, tables, and calculators. ● Recognize powers of 10 with whole number exponents by examining patterns in place value. 	<ul style="list-style-type: none"> a) Recognize and represent patterns with bases and exponents that are whole numbers. b) Recognize and represent patterns of perfect squares not to exceed 20^2, by using concrete and pictorial models. c) Justify if a number between 0 and 400 is a perfect square through modeling or mathematical reasoning. d) Recognize and represent powers of 10 with whole number exponents by examining patterns in place value.

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Computation and Estimation</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Computation and Estimation (CE)</p> <p align="center">* On the state assessment, items measuring this knowledge and skill are assessed without the use of a calculator.</p>
<p>6.5 The student will</p> <p>a) multiply and divide fractions and mixed numbers; *</p> <p>b) solve single-step and multistep practical problems involving addition, subtraction, multiplication, and division of fractions and mixed numbers; and</p> <ul style="list-style-type: none"> ● Demonstrate/model multiplication and division of fractions (proper or improper) and mixed numbers using multiple representations. (a) ● Multiply and divide fractions (proper or improper) and mixed numbers. Answers are expressed in simplest form. (a) 	<p>6.CE.1 The student will estimate, demonstrate, solve, and justify solutions to problems using operations with fractions and mixed numbers, including those in context.</p> <ul style="list-style-type: none"> a) Demonstrate/model multiplication and division of fractions (proper or improper) and mixed numbers using multiple representations.* b) Multiply and divide fractions (proper or improper) and mixed numbers that include denominators of 12 or less. Answers are expressed in simplest form.*

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Computation and Estimation</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Computation and Estimation (CE)</p> <p style="text-align: center;">* On the state assessment, items measuring this knowledge and skill are assessed without the use of a calculator.</p>
<ul style="list-style-type: none"> ● Solve single-step and multistep practical problems that involve addition and subtraction with fractions (proper or improper) and mixed numbers, with and without regrouping, that include like and unlike denominators of 12 or less. Answers are expressed in simplest form. (b) ● Solve single-step and multistep practical problems that involve multiplication and division with fractions (proper or improper) and mixed numbers that include denominators of 12 or less. Answers are expressed in simplest form. (b) 	<ul style="list-style-type: none"> c) Investigate and explain the effect of multiplying or dividing a fraction, whole number, or mixed number by a number between zero and one.* d) Estimate, determine, and justify the solution to single-step and multistep problems in context that involve addition and subtraction with fractions (proper or improper) and mixed numbers, with and without regrouping, that include like and unlike denominators of 12 or less. Answers are expressed in simplest form.
<p>6.5 The student will</p> <p>c) solve multistep practical problems involving addition, subtraction, multiplication, and division of decimals.</p> <ul style="list-style-type: none"> ● Solve multistep practical problems involving addition, subtraction, multiplication, and division with decimals. Divisors are limited to a three-digit number, with decimal divisors limited to hundredths. (c) 	<p>[Included in Grade 5 and Grade 7]</p>
<p>6.6 The student will</p> <p>a) add, subtract, multiply, and divide integers; *</p> <p>b) solve practical problems involving operations with integers; and</p> <ul style="list-style-type: none"> ● Model addition, subtraction, multiplication, and division of integers using pictorial representations or concrete manipulatives. (a) ● Add, subtract, multiply, and divide two integers. (a) ● Solve practical problems involving addition, subtraction, multiplication, and division with integers. (b) 	<p>6.CE.2 The student will estimate, demonstrate, solve, and justify solutions to problems using operations with integers, including those in context.</p> <ul style="list-style-type: none"> a) Demonstrate/model addition, subtraction, multiplication, and division of integers using pictorial representations or concrete manipulatives.* b) Add, subtract, multiply, and divide two integers.*

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Computation and Estimation</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Computation and Estimation (CE)</p> <p style="text-align: center;">* On the state assessment, items measuring this knowledge and skill are assessed without the use of a calculator.</p>
	<p>c) Simplify an expression that contains absolute value bars $$ and an operation with two integers (e.g., $- 5 - 8$ or $\frac{ -12 }{8}$) and represent the result on a number line.</p> <p>d) Estimate, determine, and justify the solution to one and two-step contextual problems, involving addition, subtraction, multiplication, and division with integers.</p>
<p>6.6 The student will</p> <p>c) simplify numerical expressions involving integers. *</p> <ul style="list-style-type: none"> ● Use the order of operations and apply the properties of real numbers to simplify numerical expressions involving more than two integers. Expressions should not include braces { } or brackets [], but may contain absolute value bars. Simplification will be limited to three operations, which may include simplifying a whole number raised to an exponent of 1, 2 or 3. (c) 	<p>[Included in 6.CE.2 and Grade 7]</p>

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Measurement and Geometry</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Measurement and Geometry (MG)</p>
<p>6.7 The student will a) derive π (pi); b) solve problems, including practical problems, involving circumference and area of a circle; and</p> <ul style="list-style-type: none"> ● Derive an approximation for pi (3.14 or $\frac{22}{7}$) by gathering data and comparing the circumference to the diameter of various circles, using concrete materials or computer models. (a) ● Solve problems, including practical problems, involving circumference and area of a circle when given the length of the diameter or radius. (b) 	<p>6.MG.1 The student will identify the characteristics of circles and solve problems, including those in context, involving circumference and area.</p> <ul style="list-style-type: none"> a) Identify and describe chord, diameter, radius, circumference, and area of a circle. b) Investigate and describe the relationship between: <ul style="list-style-type: none"> i) diameter and radius; ii) radius and circumference; and iii) diameter and circumference. c) Develop an approximation for pi (3.14) by gathering data and comparing the circumference to the diameter of various circles, using concrete manipulatives or technological models. d) Develop the formula for circumference using the relationship between diameter, radius, and pi. e) Solve problems, including those in context, involving circumference and area of a circle when given the length of the diameter or radius.
<p>6.7 The student will c) solve problems, including practical problems, involving area and perimeter of triangles and rectangles.</p> <ul style="list-style-type: none"> ● Solve problems, including practical problems, involving area and perimeter of triangles and rectangles. (c) 	<p>6.MG.2 The student will reason mathematically to solve problems, including those in context, that involve the area and perimeter of triangles and parallelograms.</p> <ul style="list-style-type: none"> a) Develop the formula for determining the area of parallelograms and triangles using pictorial representations and concrete manipulatives (e.g., two-dimensional diagrams, grid paper). b) Solve problems, including those in context, involving the perimeter and area of triangles and parallelograms. <p>[Rectangles included in Grade 4 and Grade 5]</p>

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Measurement and Geometry</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Measurement and Geometry (MG)</p>
<p>6.8 The student will</p> <p>a) identify the components of the coordinate plane; and</p> <p>b) identify the coordinates of a point and graph ordered pairs in a coordinate plane.</p> <ul style="list-style-type: none"> ● Identify and label the axes, origin, and quadrants of a coordinate plane. (a) ● Identify the quadrant or the axis on which a point is positioned by examining the coordinates (ordered pair) of the point. Ordered pairs will be limited to coordinates expressed as integers. (a) ● Graph ordered pairs in the four quadrants and on the axes of a coordinate plane. Ordered pairs will be limited to coordinates expressed as integers. (b) ● Identify ordered pairs represented by points in the four quadrants and on the axes of the coordinate plane. Ordered pairs will be limited to coordinates expressed as integers. (b) ● Relate the coordinates of a point to the distance from each axis and relate the coordinates of a single point to another point on the same horizontal or vertical line. Ordered pairs will be limited to coordinates expressed as integers. (b) ● Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to determine the length of a side joining points with the same first coordinate or the same second coordinate. Ordered pairs will be limited to coordinates expressed as integers. Apply these techniques in the context of solving practical and mathematical problems. (b) 	<p>6.MG.3 The student will describe the characteristics of the coordinate plane and graph ordered pairs.</p> <ul style="list-style-type: none"> a) Identify and label the axes, origin, and quadrants of a coordinate plane. b) Identify and describe the location (quadrant or the axis) of a point given as an ordered pair. Ordered pairs will be limited to coordinates expressed as integers. c) Graph ordered pairs in the four quadrants and on the axes of a coordinate plane. Ordered pairs will be limited to coordinates expressed as integers. d) Identify ordered pairs represented by points in the four quadrants and on the axes of the coordinate plane. Ordered pairs will be limited to coordinates expressed as integers. e) Relate the coordinates of a point to the distance from each axis and relate the coordinates of a single point to another point on the same horizontal or vertical line. Ordered pairs will be limited to coordinates expressed as integers. f) Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to determine the length of a side joining points with the same first coordinate or the same second coordinate. Ordered pairs will be limited to coordinates expressed as integers. Apply these techniques in the context of solving contextual and mathematical problems.
<p>6.9 The student will determine congruence of segments, angles, and polygons.</p>	<p>6.MG.4 The student will determine congruence of segments, angles, and polygons.</p>

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Measurement and Geometry</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Measurement and Geometry (MG)</p>
<ul style="list-style-type: none"> ● Identify regular polygons. ● Draw lines of symmetry to divide regular polygons into two congruent parts. ● Determine the congruence of segments, angles, and polygons given their properties. ● Determine whether polygons are congruent or noncongruent according to the measures of their sides and angles. 	<ul style="list-style-type: none"> a) Identify regular polygons. b) Draw lines of symmetry to divide regular polygons into two congruent parts. c) Determine the congruence of segments, angles, and polygons given their properties. d) Determine whether polygons are congruent or noncongruent according to the measures of their sides and angles.

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Probability and Statistics</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Probability and Statistics (PS)</p>
<p>6.10 The student, given a practical situation, will</p> <ul style="list-style-type: none"> a) represent data in a circle graph; b) make observations and inferences about data represented in a circle graph; and c) compare circle graphs with the same data represented in bar graphs, pictographs, and line plots. <ul style="list-style-type: none"> ● Collect, organize, and represent data in a circle graph. The number of data values should be limited to allow for comparisons that have denominators of 12 or less or those that are factors of 100 (e.g., in a class of 20 students, 7 choose apples as a favorite fruit, so the comparison is 7 out of 20, $\frac{7}{20}$, or 35%). (a) ● Make observations and inferences about data represented in a circle graph. (b) 	<p>6.PS.1 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on circle graphs.</p> <ul style="list-style-type: none"> a) Formulate questions that require the collection or acquisition of data with a focus on circle graphs. b) Determine the data needed to answer a formulated question and collect the data (or acquire existing data) using various methods (e.g., observations, measurement, surveys, experiments). c) Determine the factors that will ensure that the data collected is a sample that is representative of a larger population. d) Organize and represent data using circle graphs, with and without the use of technology tools. The number of data values should be limited to allow for comparisons that have

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Probability and Statistics</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Probability and Statistics (PS)</p>
<ul style="list-style-type: none"> Compare data represented in a circle graph with the same data represented in bar graphs, pictographs, and line plots. (c) 	<p>denominators of 12 or less or those that are factors of 100 (e.g., in a class of 20 students, 7 choose apples as a favorite fruit, so the comparison is 7 out of 20, $\frac{7}{20}$, or 35%).</p> <ul style="list-style-type: none"> Analyze data represented in a circle graph by making observations and drawing conclusions. Compare data represented in a circle graph with the same data represented in other graphs, including but not limited to bar graphs, pictographs, and line plots (dot plots), and justify which graphical representation best represents the data.
<p>6.11 The student will</p> <ul style="list-style-type: none"> a) represent the mean of a data set graphically as the balance point; and b) determine the effect on measures of center when a single value of a data set is added, removed, or changed. <ul style="list-style-type: none"> Represent the mean of a set of data graphically as the balance point represented in a line plot. (a) Determine the effect on measures of center when a single value of a data set is added, removed, or changed. (b) 	<p>6.PS.2 The student will represent the mean as a balance point and determine the effect on statistical measures when a data point is added, removed, or changed.</p> <ul style="list-style-type: none"> Represent the mean of a set of data graphically as the balance point represented in a line plot (dot plot). Determine the effect on measures of center when a single value of a data set is added, removed, or changed. Observe patterns in data to identify outliers and determine their effect on mean, median, mode, or range.
<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<p>6.12 The student will</p> <ul style="list-style-type: none"> a) represent a proportional relationship between two quantities, including those arising from practical situations; 	<p>6.PFA.1 The student will use ratios to represent relationships between quantities, including those in context.</p> <ul style="list-style-type: none"> Represent a relationship between two quantities using ratios.

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<ul style="list-style-type: none"> ● Make a table of equivalent ratios to represent a proportional relationship between two quantities, when given a ratio. (a) ● Make a table of equivalent ratios to represent a proportional relationship between two quantities, when given a practical situation. (a) 	<ul style="list-style-type: none"> b) Represent a relationship in context that makes a comparison by using the notations $\frac{a}{b}$, $a:b$, and a to b. c) Represent different comparisons within the same quantity or between different quantities (e.g., part to part, part to whole, whole to whole). d) Create a relationship in words for a given ratio expressed symbolically. e) Create a table of equivalent ratios to represent a proportional relationship between two quantities, when given a ratio. f) Create a table of equivalent ratios to represent a proportional relationship between two quantities, when given a contextual situation.
<p>6.12 The student will</p> <ul style="list-style-type: none"> b) determine the unit rate of a proportional relationship and use it to find a missing value in a ratio table; c) determine whether a proportional relationship exists between two quantities; and d) make connections between and among representations of a proportional relationship between two quantities using verbal descriptions, ratio tables, and graphs. <ul style="list-style-type: none"> ● Identify the unit rate of a proportional relationship represented by a table of values or a verbal description, including those represented in a practical situation. Unit rates are limited to positive values. (b) ● Determine a missing value in a ratio table that represents a proportional relationship between two quantities using a unit rate. Unit rates are limited to positive values. (b) 	<p>6.PFA.2 The student will identify and represent proportional relationships between two quantities, including those in context (unit rates are limited to positive values).</p> <ul style="list-style-type: none"> a) Identify the unit rate of a proportional relationship represented by a table of values, a contextual situation, or a graph. b) Determine a missing value in a ratio table that represents a proportional relationship between two quantities using a unit rate. c) Determine whether a proportional relationship exists between two quantities, when given a table of values, context, or graph. d) When given a contextual situation representing a proportional relationship, find the unit rate and create a table of values or a graph.

<p align="center">2016 Standards of Learning Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p align="center">2023 Standards of Learning Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<ul style="list-style-type: none"> ● Determine whether a proportional relationship exists between two quantities, when given a table of values or a verbal description, including those represented in a practical situation. Unit rates are limited to positive values. (c) ● Determine whether a proportional relationship exists between two quantities given a graph of ordered pairs. Unit rates are limited to positive values. (c) ● Make connections between and among multiple representations of the same proportional relationship using verbal descriptions, ratio tables, and graphs. Unit rates are limited to positive values. (d) 	<p>e) Make connections between and among multiple representations of the same proportional relationship using verbal descriptions, ratio tables, and graphs.</p>
<p>6.13 The student will solve one-step linear equations in one variable, including practical problems that require the solution of a one-step linear equation in one variable.</p> <ul style="list-style-type: none"> ● Identify examples of the following algebraic vocabulary: equation, variable, expression, term, and coefficient. ● Represent and solve one-step linear equations in one variable, using a variety of concrete materials such as colored chips, algebra tiles, or weights on a balance scale. ● Apply properties of real numbers and properties of equality to solve a one-step equation in one variable. Coefficients are limited to integers and unit fractions. Numeric terms are limited to integers. ● Confirm solutions to one-step linear equations in one variable. ● Write verbal expressions and sentences as algebraic expressions and equations. ● Write algebraic expressions and equations as verbal expressions and sentences. 	<p>6.PFA.3 The student will write and solve one-step linear equations in one variable, including contextual problems that require the solution of a one-step linear equation in one variable.</p> <ul style="list-style-type: none"> a) Identify and develop examples of the following algebraic vocabulary: equation, variable, expression, term, and coefficient. b) Represent and solve one-step linear equations in one variable, using a variety of concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles, weights on a balance scale). c) Apply properties of real numbers and properties of equality to solve a one-step equation in one variable. Coefficients are limited to integers and unit fractions. Numeric terms are limited to integers. d) Confirm solutions to one-step linear equations in one variable using a variety of concrete manipulatives and pictorial representations (e.g., colored chips, algebra tiles, weights on a balance scale).

<p style="text-align: center;">2016 Standards of Learning Essential Knowledge and Skills (EKS) Patterns, Functions, and Algebra</p>	<p style="text-align: center;">2023 Standards of Learning Knowledge and Skills (KS) Patterns, Functions, and Algebra (PFA)</p>
<ul style="list-style-type: none"> ● Represent and solve a practical problem with a one-step linear equation in one variable. 	<ul style="list-style-type: none"> e) Write a one-step linear equation in one variable to represent a verbal situation, including those in context. f) Create a verbal situation in context given a one-step linear equation in one variable.
<p>6.14 The student will</p> <p>a) represent a practical situation with a linear inequality in one variable; and</p> <p>b) solve one-step linear inequalities in one variable, involving addition or subtraction, and graph the solution on a number line.</p> <ul style="list-style-type: none"> ● Given a verbal description, represent a practical situation with a one-variable linear inequality. (a) ● Apply properties of real numbers and the addition or subtraction property of inequality to solve a one-step linear inequality in one variable, and graph the solution on a number line. Numeric terms being added or subtracted from the variable are limited to integers. (b) ● Given the graph of a linear inequality with integers, represent the inequality two different ways (e.g., $x < -5$ or $-5 > x$) using symbols. (b) ● Identify a numerical value(s) that is part of the solution set of a given inequality. (a, b) 	<p>6.PFA.4 The student will represent a contextual situation using a linear inequality in one variable with symbols and graphs on a number line.</p> <ul style="list-style-type: none"> a) Given the graph of a linear inequality in one variable on a number line, represent the inequality in two equivalent ways (e.g., $x < -5$ or $-5 > x$) using symbols. Symbols include $<$, $>$, \leq, \geq. b) Write a linear inequality in one variable to represent a given constraint or condition in context or given a graph on a number line. c) Given a linear inequality in one variable, create a corresponding contextual situation or create a number line graph. d) Use substitution or a number line graph to justify whether a given number in a specified set makes a linear inequality in one variable true. e) Identify a numerical value(s) that is part of the solution set of a given inequality in one variable.

2023 Grade 6 Mathematics SOL – Summary of Changes

Grade 6 (2016 SOL to 2023 SOL Numbering)	Parameter Changes/Clarifications (2023 SOL)
<ul style="list-style-type: none"> ● 6.1 → 6.PFA.1 ● 6.2a-b → 6.NS.1 ● 6.3a-c → 6.NS.2 ● 6.4 → 6.NS.3 ● 6.5a, b → 6.CE.1 ● 6.5c → [Included in Grades 5 and 7] ● 6.6c → [Included in 6.CE.2 and Grade 7] ● 6.7a,b → 6.MG.1 ● 6.7c → 6.MG.2 ● 6.8a-b → 6.MG.3 ● 6.9 → 6.MG.4 ● 6.10a-c → 6.PS.1 ● 6.11a-b → 6.PS.2 ● 6.12a → 6.PFA.1 ● 6.12b,c,d → 6.PFA.2 ● 6.13 → 6.PFA.3 ● 6.14a-b → 6.PFA.4 [Solving inequalities included in Grade 7] 	<ul style="list-style-type: none"> ● 6.NS.1 - Use multiple strategies & representations to express equivalency, and compare and order fractions, decimals, and percents ● 6.NS.3c - Justify if a number between 0 and 400 is a perfect square through modeling or mathematical reasoning ● 6.CE.1c - Investigate and explain the effect of multiplying or dividing a fraction, whole number, or mixed number by a number between zero and one ● 6.CE.1 and 6.CE.2 - Estimate, determine, and justify solutions ● 6.CE.2c - Simplify an expression that contains absolute value bars $$ and an operation with two integers (e.g., $- 5 - 8$ or $-12 /8$) and represent the result on a number line. ● 6.MG.1a,b,c,d -; identify and describe chord, diameter, radius, circumference, and area of a circle; describe relationships between diameter, radius, and circumference; remove $\frac{22}{7}$ as part of deriving pi; develop the formula for circumference using the relationship between diameter, radius, and pi ● 6.MG.2 - Include the development of the formula for triangles and parallelograms ● 6.PS.d,f - Include the use of technology to represent circle graphs; justify which graphical representation best represents the data ● 6. PFA.3e,f - Create a verbal situation in context given a one-step linear equation in one variable and write a one-step equation to represent a problem in context

Deletions from Grade 6 (2016 SOL)	Additions (2023 SOL)
<ul style="list-style-type: none"> ● 6.5c - Solve multi-step practical problems involving addition, subtraction, multiplication, division of decimals [Included in 5.CE.3 and 7.CE.1] ● 6.6c – Order of Operations – [Included in 7.PFA.2] ● 6.7c – Area and Perimeter of Rectangles [Included in 4.MG.3 and 5.MG.2] ● 6.14b [EKS] - Solve one-step inequalities in one variable involving addition or subtraction and graph the solution on a number line [Included in 7.PFA.4] 	<ul style="list-style-type: none"> ● 6.MG.2 – Perimeter and area of parallelograms ● 6.PS.1 [KS] - Additional data analysis knowledge and skills representing the data cycle have been included ● 6.PS.2c- Identify outliers and determine their effect on mean, median, mode, or range

KEY: NS = Number and Number Sense; CE = Computation and Estimation; MG = Measurement and Geometry; PS = Probability and Statistics; PFA = Patterns, Functions, and Algebra; EKS = Essential Knowledge and Skills (2016); KS = Knowledge and Skills (2023); US = Understanding the Standard