Math 6

Unit 1: Number Fluency

Content Area: Mathematics

Course & Grade Level: Math 6

Summary and Rationale

Number Sense is critical to developing the mindset of a mathematician. It enables mathematicians to work with different representations of numbers, estimate and judge the reasonableness of an answer. In this unit, students will develop a unified understanding of different representations of rational numbers. This unit explores many representations of fractions and decimals, how they are related to each other, and how they apply to situations. In this unit, students extend their understandings of addition, subtraction and multiplication to division. By the end of this unit, students will be able to work flexibly, efficiently and accurately with positive, rational numbers.

Recommended Pacing

41 Days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.

Standard: The Number System 5.NF.A Use equivalent fractions as a strategy to add and subtract fractions.

CPI #	Cumulative Progress Indicator (CPI)
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.
2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Standard: The Number System 6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: The Number System 6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

CPI #	Cumulative Progress Indicator (CPI)
2	Fluently divide multi-digit numbers using the standard algorithm.
3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

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.
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
Instructional Focus	
Unit Enduring Understandings	
● Mathematical problem solvers apply a variety of strategies and methods to solve problem situations. ● Number sense develops through experience. ● A quantity can be expressed numerically in different ways.	
Unit Essential Questions	
● How does finding the common characteristics among similar problems help mathematicians become more efficient problem solvers? ● What kinds of experiences help develop number sense? ● How do I determine the best numerical representation (pictorial, symbolic, objects) for a given situation? ● How do mathematical ideas interconnect and build on one another to produce a coherent whole? ● What makes a computational strategy both effective and efficient?	

Objectives

Students will know:

- The definitions of algorithm, decimal, dividend, divisor, factor, fraction, greatest common factor (GCF), least common multiple (LCM), multiple, quotient, remainder, reciprocal, and unit fraction.
- That every quotient of whole numbers (non-zero divisor) is a rational number.

Students will be able to:

- Fluently add, subtract, multiply and divide decimals and fractions.
- Solve authentic problems using decimals and fractions appropriately.
- Find GCF and LCM using a variety of strategies (Boot/Ladder, Prime Factorization, & Venn Diagrams).

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Core Math Course 1, McCaw, 2018

Unit 2: Expressions and Equations

Content Area: Mathematics

Course & Grade Level: Math 6

Summary and Rationale

Algebra provides the language through which mathematicians communicate mathematical problems. By using algebraic reasoning to model real world situations, mathematicians solve problems by connecting them to algebraic expressions and evaluating their solutions. Algebra also provides the tools necessary to represent and analyze relationships among variable quantities. In this unit, students will develop skills to manipulate equations to find unknown quantities. This will deepen their understanding of the Laws of Equality.

Recommended Pacing

27 Days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
7	Look for and make use of structure.
8	Look for and express regularity in repeated reasoning.

Standard: Expressions and Equations 6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions.

CPI #	Cumulative Progress Indicator (CPI)
1	Write and evaluate numerical expressions involving whole-number exponents.
2	Write, read, and evaluate expressions in which letters stand for numbers.
3	Apply the properties of operations to generate equivalent expressions.
4	Identify when two expressions are equivalent.

Standard: Expressions and Equations 6.EE.B Reason about and solve one-variable equations and inequalities.

CPI #	Cumulative Progress Indicator (CPI)
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.
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.
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.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
8.2	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

Instructional Focus

Unit Enduring Understandings

- Algebraic equations are powerful tools for exploring, reasoning about, and representing situations.
- Algebraic properties can generate equivalent expressions and equations even when their symbolic forms differ.
- The symbolic language of algebra is used to communicate and generalize the patterns in mathematics.
- The symbolic language of algebra is used to represent known and unknown quantities.

Unit Essential Questions

- How can algebraic equations be used to represent situations and solve real-world problems?
- What makes a solution to a real-life problem reasonable?
- How is algebra used to represent known and unknown quantities?

Objectives

Students will know:

- That a power consists of two parts, the base and the exponent.
- The order of operations describes the rules to follow when evaluating an expression with more than one operation.

- The definitions of variable, algebraic expression, term, constant, and coefficient, equivalent expressions, like terms, and factoring.
- Key words such as sum, difference, product, and quotient to describe specific operations.
- The difference between an expression and equation.
- The Distributive Property is a property that allows you to simplify computations or algebraic expressions that include parentheses.
- Inverse operations are used to solve equations.
- A value is considered the solution of an equation if it makes the equation true.

Students will be able to:

- Write and evaluate numerical and algebraic expressions containing exponents, using the order of operations.
- Write expressions involving variables.
- Recognize and combine like terms to generate equivalent expressions.
- Use the Distributive Property to perform calculations and simplify expressions.
- Apply the Distributive Property to generate equivalent expressions.
- Factor out the GCF in algebraic and numerical expressions.
- Determine if a number is a solution of an equation.
- Write and solve one-step equations using inverse operations to solve all four operations with positive numbers.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Core Math Course 1, McCaw, 2018

Unit 3: Ratios, Rates, and Percentages

Content Area: Mathematics

Course & Grade Level: Math 6

Summary and Rationale

An understanding of proportionality lays the foundation for the study of linear functions in algebra. In this unit, students will extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use ratios and proportionality to solve a wide variety of problems including percentages. Students will model and graph proportional relationships. They will distinguish proportional relationships from other relationships.

Recommended Pacing

32 Days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
6	Attend to precision.
8	Look for and express regularity in repeated reasoning.

Standard: Ratios and Proportional Relationships 6.RP.A Understand ratio concepts and use ratio reasoning to solve problems.

CPI #	Cumulative Progress Indicator (CPI)
1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
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.
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.

New Jersey Student Learning Standards for English Language Arts Companion Standards

Standard: Science Key Ideas and Details

CPI #	Cumulative Progress Indicator (CPI)
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
Standard: Strand A: Income and Careers Number Standard Statement	
CPI #	**Cumulative Progress Indicator (CPI)**
9.1.8.A.1	Explain the meaning and purposes of taxes and tax deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
New Jersey Student Learning Standards for Science	
CPI #	**Cumulative Progress Indicator (CPI)**
MS-PS1-4	Develop a model that predicts and describes changes in particle motion, temperature, and state of pure substance when thermal energy is added or removed.

Instructional Focus

Unit Enduring Understandings

- Ratios can be set equal to each other to form proportional relationships.
- In a proportion, the ratios of two quantities remains constant as the corresponding values of the quantities change.
- Proportional reasoning can be used to quantify and compare situations and model real-life phenomena.
- Problems involving equivalent ratios can be solved using a variety of models.

Unit Essential Questions

- How can ratios and rates be used to compare, model, and represent two quantities/values?
- How can we use proportional relationships to make predictions?
- How can we use ratios to solve a variety of real world problems?
- How are fractions, decimals and percentages related to one another?
- What is the most efficient method to find the missing value in a proportion?
- How can you tell if a relationship is proportional?

Objectives

Students will know:

- The definitions of conversion, conversion factor, double number line, equivalent ratio, metric system, rate, ratio, ratio table, tape diagram, unit rate, US Customary system, and percent.
- Ratios can be written in different forms.

- The language to define a ratio and describe a relationship between two quantities using proportionality.

Students will be able to:

- Describe the ratio relationship between two quantities.
- Use tables, tape diagrams, double number lines and equations to find equivalent ratios and rates.
- Identify a unit rate and solve unit rate problems, including unit pricing and constant speed.
- Use ratios to describe proportional situations and make predictions.
- Use proportional relationships to solve real world problems involving ratio, rates and percentages.
- Solve percent problems by using a variety of different strategies.
- Convert between fractions, decimals and percentages.
- Use proportional reasoning to convert between units of measurement.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Core Math Course 1

Unit 4: Area and Volume

Content Area: Mathematics

Course & Grade Level: Math 6

Summary and Rationale

Students will continue their work with area and volume from Grade 5, solving more complex, multi-step problems including surface area and volume with rational dimensions. Students will work with three-dimensional figures as they solve authentic mathematical problems.

Recommended Pacing

18 Days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
4	Model with mathematics.
5	Use appropriate tools strategically.
6	Attend to precision.
8	Look for and express regularity in repeated reasoning.

Standard: Geometry 6.G.A Solve real-world and mathematical problems involving area, surface area, and volume.

CPI #	Cumulative Progress Indicator (CPI)
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.
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.
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.
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.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings

- Measurements can be used to describe, compare, and make sense of real-world situations, including area, volume, and surface area.
- Geometry can be used to model many real life situations and to solve everyday problems.

Unit Essential Questions

- How can spatial relationships be described with precise use of geometric language?
- How are perimeter, area, surface area and volume related to one another?
- How can geometric relationships be used to solve real world problems?

Objectives

Students will know:

- The definitions of area, base, composite figure, cubic unit, face, net, perimeter, perpendicular, polygon, prism, pyramid, solid, surface area, unit cube, and volume.
- Appropriate units for perimeter, area, and volume (linear, square and cubic).

Students will be able to:

- Calculate the area of triangles, and special quadrilaterals (parallelograms and trapezoids).
- Use nets to find surface areas of 3D figures composed of rectangles and triangles.
- Calculate the volume of rectangular prisms (using the formulas V = Bh and V = lwh) using a variety of rational number measurements.
- Find the missing dimension given the area or volume of a figure.

- Find perimeters and areas of composite two-dimensional figures.
- Solve real-world problems involving surface areas and volumes of objects composed of prisms.

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Core Math Course 1, McCaw, 2018

Unit 5: Rational Numbers and The Coordinate Plane

Content Area: Mathematics

Course & Grade Level: Math 6

Summary and Rationale

Students will view positive and negative numbers in terms of everyday contexts (e.g., amounts earned/owed or temperatures above/below zero). Building on that understanding, students will compare, order, and graph integers and rational numbers leading to graphing solutions of inequalities on a number line. Graphing lines and figures on a coordinate plane is a way to visually display equations and find missing coordinates.

Recommended Pacing

29 Days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice

CPI #	Cumulative Progress Indicator (CPI)
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
4	Model with mathematics.
5	Use appropriate tools strategically.
7	Look for and make use of structure.

Standard: The Number System 6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers

CPI #	Cumulative Progress Indicator (CPI)
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.
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.
7	Understand ordering and absolute value of rational numbers.
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.

Standard: Expressions and Equations 6.EE.B Reason about and solve one-variable equations and inequalities	
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.
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.
Standard: Expressions and Equations 6.EE.C Represent and analyze quantitative relationships between dependent and independent variables	
CPI#	**Cumulative Progress Indicator (CPI)**
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.
New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings

- A relationship between two variables can be represented a variety of ways including contextual situations, equations, tables, and graphs.
- The value of a rational number is determined by its magnitude and direction on a number line (vertical and horizontal).
- The coordinate plane is used to model both mathematical and real world phenomena.
- The solution set to an inequality is a specific, infinite set that can be represented many ways.

Unit Essential Questions

- How is the value of a rational number determined?
- How is a number line used to represent and compare rational numbers?
- How can inequalities be used to represent situations?
- How is the coordinate plane used to model both mathematical and real world phenomena?
- How can variables be used to represent two quantities in a real-world problem that change in relationship to one another?

Objectives

Students will know:

- The definitions of positive numbers, negative numbers, integers, opposites, absolute value, rational numbers, inequalities, solution set, independent and dependent variables, and constant ratios.
- Inequalities have multiple answers that can make the statement true.
- Aspects of the coordinate plane such as x-axis, y-axis, origin, quadrants, and ordered pairs.
- The properties of quadrilaterals and how to identify/plot them on a coordinate grid.
- Graphs are a way to visually display equations. The input (x) is paired with the output (y) to create ordered pairs which can be graphed on a coordinate plane.
- A relationship between two variables can be represented in a variety of ways. The most common models are contextual situations, equations, tables and graphs.

Students will be able to:

- Compare and order integers and use integers to represent real-world situations.
- Order and compare rational numbers.
- Write inequalities and display the solution on a graph.
- Graph points on the coordinate plane (all 4 quadrants).
- Find the distance between 2 points on the coordinate plane (vertical and horizontal only).
- Reflect points over the x-axis and y-axis on the coordinate plane.
- Use properties of quadrilaterals to solve problems on a coordinate plane.
- Create input-output tables for equations with two variables.
- Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.
- Write two variable equations for tables, graphs and contextual situations.
- Graph a two-variable equation on the coordinate plane.

Evidence of Learning			
Assessment			
Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.			
Competencies for 21st Century Learners			
X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner
Resources			
Core Text: EdGems Core Math Course 1, McCaw, 2018			

Unit 6: Statistics

Content Area: Mathematics

Course & Grade Level: Math 6

Summary and Rationale

Building on and reinforcing their understanding of numbers, students will begin to develop their ability to think statistically. Students will recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. Students will learn to describe and summarize numerical and categorical data sets using different data displays. Students will learn to use data to discuss facts and make logical arguments.

Recommended Pacing

15 Days

New Jersey Student Learning Standards for Mathematics

Standard: Standards for Mathematical Practice	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Make sense of problems and persevere in solving them.
2	Reason abstractly and quantitatively.
3	Construct viable arguments and critique the reasoning of others.
4	Model with mathematics.
5	Use appropriate tools strategically.
Standard: Statistics and Probability 6.SP.A Develop understanding of statistical variability.	
CPI #	**Cumulative Progress Indicator (CPI)**
1	Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.
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.
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.
Standard: Statistics and Probability 6.SP.B B. Summarize and describe distributions	
CPI #	**Cumulative Progress Indicator (CPI)**
4	Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
5	Summarize numerical data sets in relation to their context.

New Jersey Student Learning Standards for English Language Arts Companion Standards	
Standard: Science Key Ideas and Details	
CPI #	**Cumulative Progress Indicator (CPI)**
RST.6-8.3.	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.
RST.6-8.7.	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
New Jersey Student Learning Standards for 21st Century Life and Careers	
Career Ready Practices	
CPI #	**Cumulative Progress Indicator (CPI)**
CRP2.	Apply appropriate academic and technical skills.
CRP4.	Communicate clearly and effectively and with reason
CRP8.	Utilize critical thinking to make sense of problems and persevere in solving them.
New Jersey Student Learning Standards for Technology	
CPI #	**Cumulative Progress Indicator (CPI)**
8.1	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

Instructional Focus

Unit Enduring Understandings

- The manner in which data is collected, analyzed, represented, and summarized influences the messages that are ultimately conveyed.
- Statistical questions anticipate variability in the data.
- Different graphs are appropriate for different kinds of situations.
- A set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.

Unit Essential Questions

- How can the collection, analysis, representation, and summary of data be used to answer questions and influence conclusions?
- What are the purposes of statistical measures and data displays?
- How do statistical measures and data displays bring meaning to individual data values?

Objectives

Students will know:

- The definitions of bias, box-and-whisker plot, categorical data, dot plot, first quartile, five-number summary, frequency table, histogram, interquartile range (IQR), mean, mean absolute deviation, measures of center, measures of variability, median, mode, numerical data, outlier, range, statistical question, statistics, and third quartile.
- When to use the appropriate measure of central tendency.
- That a measure of variation summarizes how all of the values in a data set vary with a single number.

Students will be able to:

- Recognize and create statistical questions that anticipate useful data results.
- Calculate mean, median, mode and range.
- Display data on a histogram, box-and-whisker plot, dot plot.
- Generate multiple samples of data to make inferences about a population.
- Select and justify a measure of central tendency (mean, median, or mode) that best represents a set of data.
- Describe any overall patterns in a set of data, as well as any striking deviations from the overall pattern (outliers).

Evidence of Learning

Assessment

Assessment plan may include teacher designed formative and summative assessments, a district common assessment, analysis of MAP and NJSLA data.

Competencies for 21st Century Learners

X	Collaborative Team Member	X	Effective Communicator
X	Globally Aware, Active, & Responsible Student/Citizen	X	Information Literate Researcher
X	Innovative & Practical Problem Solver	X	Self-Directed Learner

Resources

Core Text: EdGems Core Math Course 1, McCaw, 2018