Wall Township Public Schools	Board Approval Date: 8/18/2026

Course Title: Math 6

Course Description: In Grade 6, instructional time should focus on four critical areas:
(1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems;
(2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers;
(3) writing, interpreting, and using expressions and equations; and
(4) developing understanding of statistical thinking.*
**See the end of the document for additional information related to the critical areas of focus.*

New Jersey Student Learning Standards - Mathematics

Vision for Mathematics Education in New Jersey
A New Jersey education in Mathematics builds quantitatively and analytically literate citizens prepared to meet the demands of college and career, and to engage productively in an information-driven society. All students will have access to a high-quality mathematics education that fosters a population that:

- leverages data in decision-making and as a lens for discussing, analyzing, and responding to practical questions.
- persists to make sense of and model problems arising in everyday life, society, and the workplace.
- thinks critically and strategically to assess quantitative relationships and to solutions to complex problems.
- employs precise reasoning and constructs viable arguments to deduce conclusions, recognize false statements and assess peers' reasoning.
- interprets, evaluates and critiques the mathematics embedded in social, scientific and commercial systems, as well as the claims made in the private and public sectors.
- communicates precisely when conveying, representing, and justifying both qualitative and quantitative perspectives.

Standards for Mathematical Practice*

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

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
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

**See end of document for additional information related to the mathematical practices.*

Inclusion of Climate Change Opportunities

( ) notes opportunities to integrate specific examples of climate change education provided by additional age-appropriate resources

The goal of inclusion of climate change education implementation is to foster generations of New Jersey students that can analyze, question, interpret, to think independently, and bring critical deduction to fulfill, and to lead in jobs created by burgeoning industries of the future green economy.

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

Act as a responsible and contributing community members and employee
Attend to financial well-being
Consider the environmental, social and economic impacts of decisions
Demonstrate creativity and innovation
Utilize critical thinking to make sense of problems and persevere in solving them
Model integrity, ethical leadership and effective management
Plan education and career paths aligned to personal goals
Use technology to enhance productivity increase collaboration and communicate effectively
Work productively in teams while using cultural/global competence

Computer Science & Design Thinking *(CS & DT*):

Computing Systems: People interact with a wide variety of computing devices that collect, store, analyze, and act upon information in ways that can affect human capabilities both positively and negatively. The physical components (hardware) and instructions (software) that make up a computing system communicate and process information in digital form.

Data & Analysis: Computing systems exist to process data. The amount of digital data generated in the world is rapidly expanding, so the need to process data effectively is increasingly important. Data is collected and stored so that it can be analyzed to better understand the world and make more accurate predictions.

Grade 6 Math Overview	
Domain	**Cluster Headings**
Ratio and Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve problems.
The Number System	Apply and extend previous understandings of multiplication and division to divide fractions by fractions. Compute fluently with multi-digit numbers and find common factors and multiples. Apply and extend previous understandings of numbers to the system of rational numbers.
Expressions and Equations	Apply and extend previous understandings of arithmetic to algebraic expressions Reason about and solve one-variable equations and inequalities Represent and analyze quantitative relationships between dependent and independent variables
Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.
Statistics and Probability	Develop understanding of statistical variability Summarize and describe distributions

Course Sequence & Pacing

Unit Title	Estimated Number of Instructional Periods** Days, w/Optional
Unit 1: Area and Surface Area	20/23
Unit 2: Introducing Ratios	21/22
Unit 3: Unit Rates and Percentages	24/26
Unit 4: Dividing Fractions	20/22
Unit 5: Decimal Arithmetic	19/25
Unit 6: Expressions and Equations	22/23
Unit 7: Positive and Negative Numbers	19/20
Unit 8: Describing Data	20/23
Total Days	158/177

**Instructional periods are scheduled everyday for 60 minutes.

Course Sequence & Pacing

Unit Expectations for Learning	Math 6
Unit 1: Area and Surface Area • Develop and name strategies for calculating the area of more complex shapes. • Define the terms base and height for parallelograms. • Formalize understanding of base and height for parallelograms without a grid. • Make connections between the areas of triangles and the areas of parallelograms. • Calculate the areas of triangles with and without a grid. • Apply learning to a new category of shapes: polygons. • Understand surface area as a measure of three-dimensional solids. • Analyze and define the features of prisms and pyramids using precise vocabulary. • Practice identifying polyhedra from their nets. • Calculate the surface areas of prisms and pyramids from images.	20 Periods
Unit 2: Introducing Ratios • Create pizzas and use them to begin to explore relationships between quantities. • Learn what ratios are and how to describe them. • Use the structure of diagrams and their intuition to generate equivalent ratios. • Generate equivalent ratios by balancing fruit on scales. • Use double number lines to solve problems involving equivalent ratios. • Calculate the price for different quantities of items. • Determine the least common multiple (LCM) of two numbers. • Apply their knowledge of factors to determine the greatest common factor (GCF) of two numbers. • Use paint mixtures as a context to develop and share strategies for comparing ratios.	21 Periods

• Analyze recommendations from the Federal Emergency Management Association (FEMA) about various items to have on hand in case of a disaster. • Use tools to solve problems involving equivalent ratios. • Determine whether ratio reasoning can be used to understand more about the rice situation and then explore a variety of other problems. • Extend learning about ratios to explore situations where both quantities are given in the same unit. • Apply the strategies they learned in the previous lesson to solve problems about city planning involving part-part-whole ratios.	
Unit 3: Unit Rates and Percentages • Apply prior knowledge about different units of measurement, what they measure, and their relative sizes. • Begin to convert measurements from one system of measurement to another. • Convert measurements from one unit to another in different measurement systems using ratios that do not include a 1. • Use the term unit rate to calculate and compare speeds. • Compare the speeds of model trains and discuss unit rates using the word per. • Determine the two unit rates, a/b and b/a , associated with the ratio a : b. • In a table of equivalent ratios, the unit rates describe the relationship between quantities. • Practice using unit rates to make comparisons and calculate unknown values. • Use the concept of percent, meaning for every 100, and the percent symbol %. • Make connections between tape diagrams and double number line diagrams that represent percentages, then use these tools to solve problems involving friendly percentages. • Create tape diagrams, double number lines, and tables to solve problems with percentages. • Develop and use strategies to calculate any percentage of a number. • Develop and use one or more strategies to calculate any unknown percentages, including percentages greater than 100.	24 Periods

• Apply prior knowledge about rates and percentages to analyze characteristics of countries' populations.	
Unit 4: Dividing Fractions • Revisit the meaning of division by estimating quotients. • Make connections between multiplication and division situations and the tape diagrams that represent them. • Make connections between drawings, tape diagrams, and multiplication and division expressions to answer the question "How many groups?" • Extend prior knowledge about whole numbers to answer the question "How many in 1 group?" when the number of groups is a fraction. • Build on prior work using tape diagrams to answer the question "How many groups?" • Extend earlier strategies to calculate an unknown number of groups when there is less than 1 group. • Develop fluency in using common denominators to divide fractions. • Explore a strategy for dividing by a unit fraction by asking the question "How many in 1 group?" • Develop fluency with at least one method for dividing fractions. • Develop an algorithm for fraction division. • Apply earlier strategies to answer questions in context. • Practice dividing fractions by comparing lengths and answering "How many times as long?" questions. • Apply prior knowledge about multiplying and dividing fractions to a familiar context: calculating area. • Extend prior knowledge to calculate volumes of rectangular prisms with fractional dimensions.	18 Periods

Unit 5: Decimal Arithmetic • Surface different ways to reason about decimals by estimating the cost to make various dishes. • Make connections between diagrams, place value, and the decimal representation of numbers. • Add and subtract decimals by making connections between place value thinking, diagrams, and vertical calculations. • Develop fluency with adding and subtracting decimals using vertical calculations. • Reason about place value when multiplying with one non-zero digit. • Use area models to write equivalent expressions. • Use area models to multiply decimals with more than one non-zero digit. • Make sense of multiplying decimals using multiple strategies. • Analyze two methods for determining the quotient of whole numbers: area models and partial quotients. • Connect the partial quotient strategies to long division including decomposing ones into tenths. • Make sense of dividing decimals using tenths and hundredths charts. • Rewrite decimal division expressions using whole numbers, then divide using long division or partial quotients. • Practice dividing decimals to solve problems. • Practice skills involving operations with decimals. • Solve problems using percents by rewriting them as decimals. • Apply knowledge about decimals and percentages to explore prices of groceries in different cities.	22 Periods
Unit 6: Expressions and Equations • Use reasoning, equations, and tape diagrams to determine unknown weights on a seesaw. • Connect tape diagrams, equations, and situations, and use them as tools to answer questions in context.	20 Periods

• Use hangers to represent equations and then determine unknown values that balance each hanger. • Develop fluency with solving equations, particularly with equations that include decimals and fractions. • Connect equations to situations by writing situations to match equations and then trade situations with classmates. • Use expressions with variables to represent situations (in this case, the cost of some number of pounds of fruit). • Explore the concept of equivalent expressions (two different expressions that describe the same thing) in the context of the number of tiles that border a square. • Use variable expressions to represent areas of rectangles in two different ways: as the sum of two areas and as the product of the two side lengths. • Extend understanding of equivalent expressions to expressions with the distributive property and other operations. • Make sense of exponents, both when the base is a whole number and when it is a fraction. • Use areas to make sense of more complex expressions with exponents, particularly evaluating expressions that include an exponent and one other operation. • Extend understanding of numerical expressions with exponents to evaluate variable expressions that involve exponents and other operations. • Use both tables and equations to represent relationships and use the terms independent variable and dependent variable to describe each part of a relationship. • Introduction to graphs as a way of representing relationships between two variables. • Make connections between different representations of the same relationship. • Use tables, graphs, and equations to help customers make decisions about what type of transportation ticket to buy.	

Unit 7: Positive and Negative Numbers • Use positive and negative numbers to find sand dollars on a horizontal number line. • Describe and use strategies for identifying and plotting negative rational numbers on the number line. • Apply understanding of positive and negative numbers in the contexts of elevations and temperatures around the world. • Practice comparing positive and negative numbers in a social way. • Introduce absolute value and practice comparing values and absolute values through puzzles. • Apply understanding of absolute value and ordering values to real world scenarios. • Introduce inequalities with variables and connect verbal descriptions, symbols, and number line representations of inequalities. • Consolidate and apply what students have learned about inequalities on the number line and learn the term solution to an inequality. • Use the hanger representation from earlier in Grade 6 to interpret and write inequalities that involve one variable and more than one variable. • Develop an understanding of negative numbers in the coordinate plane. • Practice plotting points in the context of solving mazes, using different scales for the axes and patterns in coordinates that differ only by the sign. • Apply coordinates with positive and negative numbers to create polygons and determine distances in the coordinate plane. • Plot and interpret coordinates in order to make sense of situations in context.	17 Periods
Unit 8: Describing Data • Begin the unit by making connections between questions, claims, and two types of data. • Interpret dot plots and understand what is meant by the term statistical question. • Create dot plots to visualize data sets while attending to precision. • Describe data about minimum hourly wages by its center, shape, and spread.	19 Periods

• Explore a new way to visualize data: in a histogram. • Create histograms by hand and use histograms to compare data sets. • Explore mean as an equal share and make sense of mean as a measure of center. • Apply a new property of the mean: the sums of the absolute deviations on the left and on the right of the mean are equal. • Calculate the mean absolute deviation (MAD) of a data set and make sense of MAD as a measure of spread. • Compare real-world data sets about actor salaries using the means and mean absolute deviations (MADs). • Explore a new measure of center: the median. • Investigate how the shape of a data set affects the mean and median, and decide which measure of center best describes the data. • Understand what is meant by quartiles and why they are useful when describing data. • Explore a new way to visualize data: a box plot, and two new measures of spread: range and interquartile range (IQR). • Interpret box plots in order to make and evaluate claims about original animated movies and sequels. • Use statistics and visual representations to compare the percentage of words spoken by women and men in top-grossing movies.	

Unit 1

Desired Results

Unit 1 Title: Area and Surface Area

Unit Summary: Students learn to calculate areas of polygons by decomposing, rearranging, enclosing, and composing shapes. They also represent polyhedra with nets and calculate their surface areas.

Sub-Unit 1: Area (Lessons 2, 4, 5, 7–9 + Practice Day + Quiz)

- Calculate the area of parallelograms and triangles.
- Calculate the area of polygons by decomposing them into rectangles and triangles or by enclosing and subtracting.

Sub-Unit 2: Surface Area (Lessons 10–14 + Practice Day + Quiz)

- Connect polyhedra with nets that represent them.
- Calculate the surface area of polyhedra made up of rectangles and triangles.

Unit 1 Test

Learning Standards

NJSLS Math:
6.EE Expressions and Equations

6.EE.A. Apply and extend previous understandings of arithmetic to algebraic expressions

EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers.

EE.A.2.a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract* y *from 5" as* $5 - y$.

EE.A.2.c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = 6s^3$ *and* $A = 6s^2$ *to find the volume and surface area of a cube with sides of length* $s = \frac{1}{2}$.

6.G Geometry

G.A. Solve real-world and mathematical problems involving area, surface area, and volume

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.

G.A.4. Represent three-dimensional figures (e.g., pyramid, triangular prism, rectangular prism) 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.

Math Practices: MP1, MP3, MP4, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).

9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking (*CS & DT*):

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:

- What does it mean for two shapes to have the same area?
- How are the areas of rectangles, parallelograms, and triangles related?
- How are the surface area of polyhedra and the area of polygons related?

Unit Enduring Understandings:

Different shapes can have the same area even if they have different appearances. Area measures the amount of space a shape covers, regardless of its form.

The area formulas for rectangles, parallelograms, and triangles are connected. By breaking down and rearranging shapes, we can see how these formulas are related.

Finding the surface area of polyhedra involves calculating the area of each polygonal face. A strong

	understanding of 2D area is essential for working with 3D shapes.
Vocabulary: area, base (of a parallelogram or triangle), base (of a prism or pyramid), face, height, net, parallelogram, quadrilateral, polygon, polyhedron, prism, pyramid, surface area, volume	
Students will be able to: **Lesson 2: "Letters"** ***Area Strategies*** Develop and name strategies for calculating the area of more complex shapes. 6.G.A.1 MP3 MP6 MP7 **Lesson 4: "Exploring Parallelograms, Part 1"** ***Parallelograms on a Grid*** Define the terms base and height for parallelograms. 6.EE.A.2.A 6.EE.A.2.C 6.G.A.1 MP1 MP6 MP8 **Lesson 5: "Off the Grid, Part 1"** ***Calculating Areas of Parallelograms*** Formalize understanding of base and height for parallelograms without a grid. 6.EE.A.2.A 6.EE.A.2.C 6.G.A.1 MP3 MP6 **Lesson 7: "Triangles and Parallelograms"** ***Generalizing the Area of a Triangle*** Make connections between the areas of triangles and the areas of parallelograms. 6.EE.A.2.A 6.G.A.1 MP8 **Lesson 8: "Off the Grid, Part 2"*Applying the Formula for the Area of a Triangle*** Calculate the areas of triangles with and without a grid. 6.EE.A.2.A 6.G.A.1 MP8 **Lesson 9: "Pile of Polygons"** ***Investigating Polygons and Their Areas*** Apply learning to a new category of shapes: polygons. 6.G.A.1 MP3 MP6 **Lesson 10: "Renata's Stickers"** ***Intro to Surface Area*** Understand surface area as a measure of three-dimensional solids. 6.G.A MP1 MP7 **Lesson 11: "Plenty of Polyhedra"** ***Polyhedra and Their Faces*** Analyze and define the features of prisms and pyramids using precise vocabulary. 6.G.A.4 MP6	

Lesson 12: "Nothing But Nets" ***Nets and Surface Area*** on a Grid Practice identifying polyhedra from their nets. 6.G.A.4 MP3 MP6

Lesson 13: "Face Value" ***Surface Area Without a Grid*** Calculate the surface areas of prisms and pyramids from images. 6.G.A.4 MP3 MP6 MP7

Learning Activities: *Suggested or Potential Learning Activities*
Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons.

The following activities will be used to supplement learning:

- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students. Students will work in DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Day 1: Lesson 2: "Letters" - *Area Strategies*

Day 2: Lesson 4: "Exploring Parallelograms, Part 2" - *Parallelograms on a Grid*

Combined Lesson 3 of estimating area with Lesson 4 of finding the area using the formula. Introduced Lesson 4 using a modified version of the Lesson 3 Lesson Summary, which reviews two different strategies to find the area of a parallelogram on a grid.

Day 3: Lesson 5: "Off the Grid, Part 1" - *Calculating Areas of Parallelograms*

Day 4: Review of lessons 1.04 and 1.05 using the Boost Lesson 1.04, and Desmos Amplify Additional Practice Worksheets.

Day 5: Lesson 7: "Triangles and Parallelograms" - *Generalizing the Area of a Triangle*

Introduce Lesson 7 using a modified version of the Lesson 6 Lesson Summary, which reviews a variety of strategies to find the area of a triangle on a grid.

Day 6: Lesson 8: “Off the Grid, Part 2” - *Applying the Formula for the Area of a Triangle*

Days 7-8: Lesson 9: “Pile of Polygons” - *Investigating Polygons and Their Areas*

Day 9: Practice day - BTC Activity + Review with Desmos Additional Practice Worksheets

Day 10: Amplify “Practice Day 1” Activity - Partner Practice Worksheet

Day 11: Sub-Unit 1 Quiz - Area - Students calculate the area of parallelograms and triangles, calculate the area of polygons by decomposing them into rectangles and triangles or by enclosing and subtracting, describe the relationship between a base of a parallelogram or triangle and its corresponding height using mathematically precise language, and analyze strategies for determining the area of polygons using mathematically precise language.

Day 12: Lesson 10: “Renata’s Stickers” - *Intro to Surface Area*

Day 13: Lesson 11: “Plenty of Polyhedra” - *Polyhedra and Their Faces*

BTC Activity incorporating prerequisite skill: Classify two-dimensional figures in a hierarchy based on properties.

Day 14: Lesson 12: “Nothing But Nets” - *Nets and Surface Area*

Days 15-16: Lesson 13: “Face Value” - *Surface Area Without a Grid*

Day 17: Amplify Additional Practice Day

Day 18: Sub Unit 2 Surface Area Quiz - Students connect polyhedra with nets that represent them, calculate the surface area of polyhedra made up of rectangles and triangles, describe the polyhedron that can be assembled from a given net using mathematically precise language, including terms such as *face*, *edge*, *prism*, and *pyramid*,

and analyze strategies for determining the surface area of polyhedra using mathematically precise language, including terms such as *face*, *edge*, *base*, and *height*.

Day 19: Amplify Unit 1 Review - Scavenger Hunt, Digital Activities, Khan Academy

Day 20: Amplify Unit 1 Test. Followed by Unit 2 Pre-Check

The following activities will be used to supplement learning:

- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students. Students will work in DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Amplify Aligned Practice:

- 6.1 Lesson Practice 6.1.01 - 6.1.14
- 6.1 Additional Practice 6.1.01 - 6.1.14
- ML 6.1.05 Mini-Lesson: Calculating Areas of Parallelograms
- ML 6.1.08 Mini-Lesson: Calculating Areas of Triangles
- ML 6.1.10 Mini-Lesson: Determining Surface Areas of Rectangular Prisms
- 6.1.04 Boost Personalized Learning Activity: Area of Parallelograms
- 6.1.12 Boost Personalized Learning Activity: Surface Area
- 6.1 Unit Math Language Development Resources 6.1.01 - 6.1.14
- 6.1 Sub-Unit 1 Extensions: Area
- 6.1 Sub-Unit 2 Extensions: Surface Area
- 6.1 Math in Action
- Lesson 14: “Take It To Go” Surface Area In Context (Students use creativity, personal experiences, and the concepts they learned in this unit to design a to-go container. 6.G.A.1, 6.G.A.4, MP1, MP4)

DeltaMath Additional Activities:

- Teacher Team-created weekly DeltaMath spiral cumulative reviews
- **Area** (Lessons 2, 4, 5, 7–9)
    - Area of a Triangle (Interactive)
    - Area of Composite Shapes (Trapezoids and Triangles)

  Extension:
    - Area Puzzles (Rectangles / Squares)
    - Write Expression with Exponents from Figure (Area)
    - Area of Triangles -- includes fractions and decimals, as well as, finding the missing bas
- **Surface Area** (Lessons 10–14)
    - Identify Prism / Pyramid from a Net
    - Surface Area from a Net (Level 1) -- includes decimals

  Extension:
    - Surface Area from a Net (Level 2)

Additional Activities

Available in a Math 6 Amplify Desmos Unit 1 Teacher Curriculum Resources Folder.

- **Area** (Lessons 2, 4, 5, 7–9)
    - Area of Parallelograms Maze
    - Area of Triangles Maze
    - Area of Parallelograms & Triangles Drag & Drop
    - Area of Parallelograms and Triangles Digital Matching Activity
    - Area of Parallelograms and Triangles Scavenger Hunt
    - Area of Polygons Maze
    - Polly's Pizza Digital Activity
- **Surface Area** (Lessons 10–14)
    - Surface Area of Prisms Matching

- Surface Area of Rectangular Prisms
- Surface Area of Rectangular Prisms Maze
- Surface Area of Nets Slides
- Surface Area Murder Mystery
- Surface Area Digital Activity
- Surface Area and Nets Rectangular Prisms Self-Check Activity
- 6th Grade Math Surface Area

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit 1 Quiz, Sub-Unit 2 Quiz, Show What You Know

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Units 1 & 2 Benchmark

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • cardstock or blank sheets of paper (Lesson 14) • coloring tools (Lessons 7–8, 14) • graph paper (Lessons 7, 9, 12) • rulers (Lessons 3–4, 7, 12, 14) • sample to-go containers (optional) (Lesson 14) • scissors (Lessons 6, 12, 14) • straightedges (optional) (Lesson 9) • tape (Lesson 12, 14) • tracing paper (Lessons 6–7)

mClass Diagnostic & Practice, DeltaMath, Khan Academy,LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:
Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback
Alternate or reduced work within Digital Platforms such as Link It assignments

Specific Strategies and Practices that Support English Language Learners
English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups
Alternate or reduced work within Digital Platforms such as-Delta Math, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as-Delta Math, and Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan.

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as Delta Math, and Link It assignments

Unit 2

Desired Results

Unit 2 Title: Introducing Ratios

Unit Summary: Students are introduced to the concept of ratios. They represent ratios using double number lines, tables, and tape diagrams and use ratio reasoning to solve problems.

Sub-Unit 1: Ratios (Lessons 1–6 + Practice Day + Quiz)

- Use tables, double number line diagrams, and ratios per `1` to solve problems with equivalent ratios.
- Describe ratio relationships between two quantities using appropriate notation and mathematically precise language.
- Analyze strategies for solving problems involving equivalent ratios, including using tables and double number line diagrams.

Sub-Unit 2: Common Factors and Multiples (Lessons 7–9 + Practice Day + Mid Topic 2 Test)

- Determine the least common multiple and greatest common factor of two numbers.

Sub-Unit 3: Solving Problems With Ratios (Lessons 10–15 + Practice Day + Quiz)

- Compare ratios in context using a variety of strategies.
- Solve real-world and mathematical problems using double number line diagrams and tables of equivalent ratios.

Learning Standards

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

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."*

RP.A.2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, 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 ¾-cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* ***(Clarification: Expectations for unit rates in this grade are limited to non-complex fractions.)***

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.

RP.A.3.a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

RP.A.3.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?*

Math Practices: MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking (*CS & DT*):

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
• What does a ratio say about the relationship between quantities? • How can ratios help you get the same taste, texture, or color every time you make a recipe? • How can ratios help us consider issues of fairness?	Ratios describe the relationship between two or more quantities, showing how much of one thing there is compared to another. Using equivalent ratios helps maintain consistency in real-world situations like recipes, ensuring the same results each time. Ratios can be used to analyze and evaluate fairness in comparisons, decisions, and distributions.

Vocabulary: double number line, equivalent ratio, per, ratio, table, tape diagram, unit price, unit rate

Students will be able to:

Lesson 1 "Pizza Maker" ***Exploring Ratios*** Create pizzas and use them to begin to explore relationships between quantities. 6.RP.A.1 MP3

Lesson 2 "Ratio Relationships" ***Describing Ratios*** Learn what ratios are and how to describe them. 6.RP.A.1 MP6

Lesson 3 "Rice Ratios" ***Introduction to Equivalent Ratios*** Use the structure of diagrams and their intuition to generate equivalent ratios. 6.RP.A.1 MP7

Lesson 4 "Fruit Lab" ***Creating Equivalent Ratios*** Generate equivalent ratios by balancing fruit on scales. 6.RP.A.3.A MP1 MP3 MP7

Lesson 5 "Balancing Act" ***Introduction to Double Number Lines*** Use double number lines to solve problems involving equivalent ratios. 6.RP.A.3 6.RP.A.3.A MP3 MP6

Lesson 6 "Product Prices" ***Price for One*** Calculate the price for different quantities of items. 6.RP.A.3 MP8

Lesson 7 Common Multiples" ***Investigating Least Common Multiple*** Determine the least common multiple (LCM) of two numbers. 6.NS.B.4 MP1 MP3

Lesson 8 "Common Factors" ***Investigating Greatest Common Factor*** Apply their knowledge of factors to determine the greatest common factor (GCF) of two numbers. 6.NS.B.4 MP3 MP6

Lesson 9 "Mixing Paint, Part 1" ***Comparing Ratios*** Use paint mixtures as a context to develop and share strategies for comparing ratios. 6.RP.A.3 MP2 MP3 MP7

Lesson 10 "Disaster Preparation" ***Using Ratio Tables With Large Quantities*** Analyze recommendations from the Federal Emergency Management Association (FEMA) about various items to have on hand in case of a disaster. 6.RP.A.3.A MP2 MP4

Lesson 11 "Balloons" ***Solving Ratio Problems*** Use tools to solve problems involving equivalent ratios. 6.RP.A.3 6.RP.A.3.A MP2 MP5 MP7

Lesson 12 "Community Life" ***Solving Equivalent Ratio Problems in Context*** Determine whether ratio reasoning can be used to understand more about the rice situation and then explore a variety of other problems. 6.RP.A.3 MP1 MP5

Lesson 13 "Mixing Paint, Part 2"*Part-Part-Whole Ratios* Extend learning about ratios to explore situations where both quantities are given in the same unit. 6.RP.A.3 MP1 MP6

Lesson 14 "City Planning" ***Applying Part-Part-Whole Ratio Problems*** Apply the strategies they learned in the previous lesson to solve problems about city planning involving part-part-whole ratios. 6.RP.A.3 MP2 MP4 MP6

Learning Activities: *Suggested or Potential Learning Activities*
Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons.

Day 1: Teacher Team-created review of equivalent fractions, simplifying fractions, and finding common denominators when adding or subtracting fractions.
Day 2: Lesson 1 "Pizza Maker" - *Exploring Ratios*
Day 3: Lesson 2 "Ratio Relationships" - *Describing Ratios*

Day 4: Lesson 3 "Rice Ratios" - *Introduction to Equivalent Ratios*

Slide 5 on Lesson Practice was hard.

Day 5: Lesson 4 "Fruit Lab" - *Creating Equivalent Ratios*

Day 6: Lesson 5 "Balancing Act" - *Introduction to Double Number Lines*

Stress the importance of starting with 0 on both number lines and labeling the number lines.

Day 7: Lesson 6 “Product Prices” - *Price for One*

Day 8: Practice Day - Desmos 2.04 Boost as Warm-Up - Desmos Practice Day 1 Review

Day 9: Sub Unit 1 Quiz - Ratios - Students use tables, double number lines, and ratios per `1` to solve problems with equivalent ratios, describe ratio relationships between two quantities using appropriate notation and mathematically precise language, and analyze strategies for solving problems involving equivalent ratios, including using tables and double number lines.

Day 10: Lesson 7 Common Multiples” - *Investigating Least Common Multiple*

Have students write out multiples in their workbooks.

Day 11: Lesson 8 “Common Factors” - *Investigating Greatest Common Factor*

Have students write out factors in their workbooks.

Day 12: Lesson 9 “Mixing Paint, Part 1” - *Comparing Ratios*

Use workbooks and the online presentation.

Day 13: Practice Day on lessons 1-9. Need more GCF and LCM practice

Day 14: Mid Topic 2 Test - Common Factors and Multiples - Students determine the least common multiple and greatest common factor of two numbers, and interpret least common multiples and greatest common factors in mathematical and real-world situations.

Day 15: Lesson 10 “Disaster Preparation” - *Using Ratio Tables With Large Quantities*

Complete Activity 2 together.

Day 16: Lesson 11 “Balloons” - *Solving Ratio Problems*

Day 17: Lesson 12 “Community Life” - *Solving Equivalent Ratio Problems in Context*

Day 18: Lesson 13 “Mixing Paint, Part 2” - *Part-Part-Whole Ratios*

Day 19: Lesson 14 “City Planning” - *Applying Part-Part-Whole Ratio Problems*

Day 20: Practice Day 3 on Lessons 10-14.

Day 21: Sub Unit 2 Quiz - Solving Problems With Ratios - Students compare ratios in context using a variety of strategies, solve real-world and mathematical problems using double number lines and tables of equivalent ratios, describe strategies for comparing ratios in context, and interpret different representations of a ratio relationship to make sense of a situation in context.

Followed by Unit 3 Pre-Unit Check

The following activities will be used to supplement learning:

- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students. Students will work in DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Amplify Aligned Practice:

- 6.2 Lesson Practice 6.2.01 - 6.2.14
- 6.2 Additional Practice 6.2.01 - 6.2.14
- ML 6.2.04 Mini-Lesson: Generating Equivalent Ratios
- ML 6.2.09 Mini-Lesson: Comparing Ratios
- ML 6.2.14 Mini-Lesson: Applying Part-Part-Whole Relationships
- 6.2.04 Boost Personalized Learning Activity: Generate Equivalent Ratios
- 6.2.13 Boost Personalized Learning Activity: Determining the Parts to Make the Given Whole
- 6.2 Unit Math Language Development Resources 6.2.01 - 6.2.14
- 6.2 Sub-Unit 1 Extensions: Ratios
- 6.2 Sub-Unit 2 Extensions: Common Factors and Multiples

- 6.2 Sub-Unit 3 Extensions: Solving Problems With Ratios
- 6.2 Math in Action
- Lesson 15 “Lunch Waste” *Applying Ratio Strategies* (Students use personal experiences and different kinds of ratio reasoning to make sense of school lunch waste. 6.RP.A.3, MP3, MP4, MP5)

DeltaMath Additional Activities:

- Teacher Team-created weekly DeltaMath spiral cumulative reviews.

- **Ratios (Lessons 1-6)**
  - Intro to Ratios (Level 1)
  - Intro to Ratios (Level 2)
  - Doubling or Tripling a Recipe (Whole Numbers)
  - Halving or Thirding a Recipe (Whole Numbers)
  - Doubling or Tripling a Recipe (Mixed Numbers)
  - Halving or Thirding a Recipe (Mixed Numbers)
  - Simplifying Ratios (Basic)
  - Simplifying Ratios
  - Using Ratio Language
  - Visualizing Simplified Ratios L1
  - Visualizing Simplified Ratios L2
  - Equivalent Ratios
  - Double number lines (lesson 5)
    - Intro to Double Number Line L1
    - Intro to Double Number Line L2
    - Intro to Double Number Line L3
    - Double Number Line (Scaling Up/Down)

        - Double Number Line (Scaling Up/Down: Level 2)
        - Double Number Line (Scaling Up/Down: Level 3)
        -
    - Unit Price (lesson 6)
        - Which Price is Better? Level 1
        - Which Price is Better? Level 2

- **Common Factors & Multiples (Lessons 7-9)**
    - Greatest Common Factor
    - GCF/LCM (Division Algorithm)
    - GCF/LCM Word Problems L1
    - GCF/LCM Word Problems L2
    - Greatest Common Factor (Numbers)

  Extension:

    - Find Numbers Given GCF/LCM (MC)

- **Solving Problems With Ratios (Lessons 10-15)**
    - Intro to Ratio Tables L1
    - Intro to Ratio Tables L2
    - Intro to Ratio Tables L3
    - Ratio Table for Proportional Reasoning L1
    - Ratio Table for Proportional Reasoning L2

- Ratio Table for Proportional Reasoning (Scale Up/Down)
- Proportional Reasoning with Ratio Table (Decimals) L1
- Proportional Reasoning with Ratio Table (Decimals) L2
- Which is more? Ratio Concept (Level 1)
- Which is more? Ratio Concept (Level 2)
- Part-to-Part vs. Part-to-Whole (Level 1)
- Part-to-Part vs. Part-to-Whole (Level 2)
- Three-Part Ratios (Level 1)
- Three-Part Ratios (Level 2)

Additional Activities

Available in a Math 6 Amplify Desmos Unit 2 Teacher Curriculum Resources Folder.

- **Ratios (Lessons 1-6)**
  - Ratios in the Sea slides
  - Writing Ratios Maze
  - Ratios Bingo
  - Ratios Self-Checking Stars
  - Equivalent Ratios Slides
  - Equivalent Ratios Maze
  - Proportions Slides
  - Double Number Line Practice (Slides)
  - Double Number Lines “Ratio & Rate Road Trip”
  - Finding Unit Rate Drag and Drop
  - Unit Rate Maze
- **Common Factors & Multiples (Lessons 7-9)**

- GCF Maze
- LCM Maze

- **Solving Problems With Ratios (Lessons 10-15)**
  - Ratio Table Slides
  - Ratio Tables Scavenger Hunt

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit 1 Quiz, Sub-Unit 2 Quiz, Show What You Know

Summative Assessments: Mid Topic 2 Test

Common Benchmark Assessments: Units 1 & 2 Benchmark

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • calculators (optional) (Lesson 8) • coloring tools (Lessons 7, 9–10, 14) • highlighters (Lesson 7) • multiplication tables (optional) (Lesson 8) • posters (Lesson 10) • small chips (Lesson 7)

mClass Diagnostic & Practice, DeltaMath, Khan Academy, LinkIt!

Accommodations and Modifications:
Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:

Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning

-Enrichment/Extension Activities within Digital Platforms such as DeltaMath, and Link It assignments

Unit 3

Desired Results

Unit 3 Title: Unit Rates and Percentages

Unit Summary: Students apply ratio reasoning from Unit 2 to unit rates and recognize that equivalent ratios have the same unit rates.

Sub-Unit 1: Units and Measurement (Lessons 1–3)

- Use ratio reasoning to convert between units of measurement.
- Explain why it takes more of a smaller unit or fewer of a larger unit to measure the same quantity.
- Describe connections between units of measurement and the measurements of everyday objects.

Sub-Unit 2: Unit Rates (Lessons 4–8 + Practice Day + Quiz)

- Recognize and calculate two unit rates for the same ratio relationship.
- Use unit rates to solve problems involving tables of equivalent ratios.
- Identify and describe the two unit rates associated with a ratio (i.e., a/b and b/a for the ratio a : b)

Sub-Unit 3: Percentages (Lessons 9–14 + Practice Day)

- Use ratio reasoning to determine unknown parts, wholes, and percentages.
- Describe connections between percentages, ratios, and rates.

Learning Standards

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

RP.A.2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, 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 ¾-cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* ***(Clarification: Expectations for unit rates in this grade are limited to non-complex fractions.)***

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.

RP.A.3.a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

RP.A.3.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?*

RP.A.3.c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $\frac{30}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.

RP.A.3.d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Math Practices: MP1, MP2, MP3, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
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9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking (*CS & DT***):**

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:

- How are the terms same rate, constant rate, and unit rate alike and different?
- What is the relationship between unit rates and percentages?
- How are percentages used to estimate and compare quantities?

Unit Enduring Understandings:

Same rate, constant rate, and unit rate all describe consistent relationships between quantities, but a unit rate specifically compares to one unit and is often used to simplify comparisons.

Unit rates and percentages both describe proportional relationships and can be used to compare values; percentages are a specific type of unit rate with a

	denominator of 100. Percentages help us estimate, compare, and make sense of quantities in everyday situations by expressing parts of a whole in a familiar and consistent format.
Vocabulary: percent, percentage, rate, unit price, unit rate	
Students will be able to: ***Lesson 1 "Many Measurements"** ***Everyday Measurements*** Apply prior knowledge about different units of measurement, what they measure, and their relative sizes. Building Toward: 6.RP.A.3.D MP3 MP6 **Lesson 2 "Counting Classrooms"** ***Measuring With Different Units*** Begin to convert measurements from one system of measurement to another. 6.RP.A.3.D MP2 MP3 MP6 **Lesson 3 "Pen Pals"** ***Converting Units*** Convert measurements from one unit to another in different measurement systems using ratios that do not include a 1. 6.RP.A.3.D MP2 MP5 MP6 **Lesson 4 "World Records"** ***Comparing Speeds*** Use the term unit rate to calculate and compare speeds. 6.RP.A.2 6.RP.A.3 6.RP.A.3.A 6.RP.A.3.B MP3 **Lesson 5 "Model Trains"** ***Comparing Rates*** Compare the speeds of model trains and discuss unit rates using the word per. 6.RP.A.2 6.RP.A.3.B 6.RP.A.3.D MP3 MP6 **Lesson 6 "Soft Serve"** ***Two Unit Rates*** Determine the two unit rates, a/b and b/a , associated with the ratio a : b. 6.RP.A.2 6.RP.A.3 6.RP.A.3.B MP3 MP6 ***Lesson 7 "Welcome to the Robot Factory"** ***Using Unit Rates*** In a table of equivalent ratios, the unit rates describe the relationship between quantities. 6.RP.A.2 6.RP.A.3 6.RP.A.3.B MP7	

Lesson 8 "More Soft Serve" ***Solving Rate Problems*** Practice using unit rates to make comparisons and calculate unknown values. 6.RP.A.2 6.RP.A.3 6.RP.A.3.A 6.RP.A.3.B MP1 MP3 MP7

Lesson 9 "Lucky Duckies" ***Benchmark Percentages*** Use the concept of percent, meaning for every 100, and the percent symbol %. 6.RP.A.3 6.RP.A.3.C MP1 MP3 MP8

Lesson 10 "Bicycle Goals" ***Friendly Percentages*** Make connections between tape diagrams and double number line diagrams that represent percentages, then use these tools to solve problems involving friendly percentages. 6.RP.A.3 6.RP.A.3.C MP2 MP3 MP6

Lesson 11 "What's Missing?" ***Solving Percentage Problems*** Create tape diagrams, double number lines, and tables to solve problems with percentages. 6.RP.A.3 6.RP.A.3.C MP7

Lesson 12 "Cost Breakdown" ***Any Percentage of a Number*** Develop and use strategies to calculate any percentage of a number. 6.RP.A.3 6.RP.A.3.C MP3 MP8

Lesson 13 "More Bicycle Goals" ***Unknown Percentages*** Develop and use one or more strategies to calculate any unknown percentages, including percentages greater than 100. 6.RP.A.3 6.RP.A.3.C MP3 MP8

Lesson 14 "A Country as a Village" ***Applying Ratios, Rates, and Percentages*** Apply prior knowledge about rates and percentages to analyze characteristics of countries' populations. 6.RP.A.3 6.RP.A.3.C MP1 MP6

**Optional Lesson*

Learning Activities: *Suggested or Potential Learning Activities*
Each Desmos lesson is designed to take one full class period. Practice days will be added after every few lessons.

Day 1: *Lesson 1 "Many Measurements" *Everyday Measurements*

Great intro lesson, has students move around.

Day 2: Lesson 2 “Counting Classrooms” *Measuring With Different Units*

Day 3: Lesson 3 “Pen Pals” *Converting Units*

Day 4: Review of lessons 1-3 + Graded Exit Ticket

Day 5: Lesson 4 “World Records” *Comparing Speeds*

Day 6: Lesson 5 “Model Trains” *Comparing Rates*

Day 7: Practice Day - Desmos & Amplify Additional Practice Worksheets

Day 8: Lesson 6 “Soft Serve” *Two Unit Rates*

BTC Lesson

Day 9: Lesson 7 “Welcome to the Robot Factory” *Using Unit Rates*

BTC Lesson

Day 10: Review of lessons 6 & 7 - Amplify Additional Practice Worksheets

Day 11: Lesson 8 “More Soft Serve” *Solving Rate Problems*

BTC Lesson

Day 12: Amplify “Practice Day 1” - Desmos Review Sheets

Day 13: Desmos Sub-Unit 1 Quiz - Units and Measurement and Unit Rates - Students use ratio reasoning to convert between units of measurement, explain why it takes more of a smaller unit or fewer of a larger unit to measure the same quantity, and describe connections between units of measurement and the measurements of everyday objects. Students recognize and calculate two unit rates for the same ratio relationship, use unit rates to solve problems involving tables of equivalent ratios, and identify and describe the two unit rates associated with a ratio.

Day 14: Lesson 9 “Lucky Duckies” *Benchmark Percentages*

Day 15: Lesson 10 “Bicycle Goals” *Friendly Percentages*

Day 16: Lesson 11 “What’s Missing?” *Solving Percentage Problems*

Do the Activities together, don’t give out the cards - only confuse students more.

Day 17-18: Lesson 12 “Cost Breakdown” *Any Percentage of a Number*

Need to add a day (day 17) to practice finding the part, whole, or percent.

Day 19: Lesson 13 “More Bicycle Goals” *Unknown Percentages*

Day 20: Practice Day 2 - Paper Practice + Quiz

Day 21: Percent Quiz - given on the computer - Percentages - Students use ratio reasoning to determine unknown parts, wholes, and percentages, and describe connections between percentages, ratios, and rates.

Days 22-23: Amplify **“**Practice Day 3” - Paper Review

Day 24: Amplify Unit 3 Test - given on the computer. Followed by Unit 4 Pre-Unit Check

The following activities will be used to supplement learning:

- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of all students. Students will work in DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

<u>Amplify Aligned Practice:</u>

- 6.3 Lesson Practice 6.3.01 - 6.3.16
- 6.3 Additional Practice 6.3.01 - 6.3.15

- ML 6.3.02 Mini-Lesson: Converting Measurements
- ML 6.3.04 Mini-Lesson: Calculating Unit Rate
- ML 6.3.13 Mini-Lesson: Calculating Unknown Percentages
- 6.3.05 Boost Personalized Learning Activity: Calculating and Comparing Rates
- 6.3.10 Boost Personalized Learning Activity: Determining the Unknown Parts and Wholes, Given Friendly Percentages
- 6.3 Unit Math Language Development Resources 6.3.01 - 6.3.16
- 6.3 Sub-Unit 1 Extensions: Units and Measurement
- 6.3 Sub-Unit 2 Extensions: Unit Rates
- 6.3 Sub-Unit 3 Extensions: Percentages
- 6.3 Math in Action

DeltaMath Aligned Practice

- **Units and Measurement** (Lessons 1–3)
    - Proportional Reasoning Change Units (Guided)
    - Proportional Reasoning Change Units
- **Unit Rates** (Lessons 4–8)
    - Finding Unit Rates (Guided)
    - Multistep Unit Rate
    - Proportional Reasoning
- **Percentages** (Lessons 9–14)
    - Percent (Quartiles) Guided
    - Percent (Quartiles)
    - Percent (Deciles) Guided
    - Percent (Deciles)
    - Proportional Reasoning, Percents (Level 1)

    - Proportional Reasoning, Percents (Level 2)
    - Proportional Reasoning, Percents (Level 3)
    - Percent of Whole Word Problems L1
    - Percent of Whole Word Problems L2

Additional Activities
Available in a Math 6 Amplify Desmos Unit 2 Teacher Curriculum Resources Folder.

- **Units and Measurement** (Lessons 1–3)
    - Metric to Customary Conversions Riddle Worksheet
    - Customary to Metric Bingo
    - Measurement Bingo
    - Customary & Metric Conversions Communicator Review
- **Unit Rates** (Lessons 4–8)
    - Unit Price Slides
    - Equivalent Ratios and Unit Price Slides
    - Ratios Escape Room
- **Percentages** (Lessons 9–14)
    - Percent of a Number Maze
    - Part, Whole, Percent Word Problems Communicator Review
    - Percent Proportion Back to School Bingo
    - Percent of a Number Digital Maze
    - Percentages Digital Color By Number
    - Percent of a Number Digital Puzzle

Assessment Evidence
Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz, Show What You Know, DeltaMath
Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Units 1-3 Benchmark
Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials
Core Instructional Program: Amplify Desmos Math Online Platform
Desmos Materials by Lesson:• calculators (Lesson 4) • classroom items that represent measurements, such as a centimeter, an ounce, a cup, etc. (as needed) (Lesson 1) • coloring tools (as needed) (Lessons 7, 12, 14) • glue or tape (as needed) (Lesson 11) • graph paper (optional) (Lesson 11) • meter sticks (as needed) (Lesson 2) • poster paper (Lesson 14) • rulers (as needed) (Lesson 2) • stopwatches or other timers (Lesson 4) • straightedges (as needed) (Lesson 14) • tape (Lesson 4)
mClass Diagnostic & Practice, Khan Academy,LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners,

Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:
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- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

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English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice Alternate or reduced work within Digital Platforms such as-Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans
Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.

504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning

-Enrichment/Extension Activities within Digital Platforms such as DeltaMath, and Link It assignments

Unit 4

Desired Results

Unit 4 Title: Dividing Fractions

Unit Summary: Students extend what they learned about dividing whole numbers to divide fractions by fractions.

Sub-Unit 1: Introduction to Dividing Fractions (Lessons 1–4)

- Create and interpret diagrams that represent dividing whole numbers by fractions.
- Analyze diagrams that represent dividing by fractions.

Sub-Unit 2: Dividing Fractions (Lessons 5–11 + Practice Day + Quiz)

- Use a variety of strategies to calculate quotients of fractions.
- Solve problems that involve dividing fractions.

Sub-Unit 3: Area and Volume With Fractions (Lessons 12–15 + Practice Day)

- Use division of fractions to compare lengths.
- Solve problems about areas and volumes with fractional dimensions.

Learning Standards

NJSLS Math:

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

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.

G.A.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

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

NS.A.1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for* $\left(\frac{2}{3}\right) \div \left(\frac{3}{4}\right)$ *and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that* $\left(\frac{2}{3}\right) \div \left(\frac{3}{4}\right) = \frac{8}{9}$ *because* $\frac{3}{4}$ *of* $\frac{8}{9}$ *is* $\frac{2}{3}$. *(In general,* $\left(\frac{a}{b}\right) \div \left(\frac{c}{d}\right) = \frac{ad}{bc}$ *). How much chocolate will each person get if 3 people share* $\frac{1}{2}$ *lb. of chocolate equally? How many* $\frac{3}{4}$ *cup servings are in* $\frac{2}{3}$ *of a cup of yogurt? How wide is a rectangular strip of land with length* $\frac{3}{4}$ *mi and area* $\frac{1}{2}$ *square mi?*

Math Practices: MP1, MP2, MP3, MP4, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking ***(****CS & DT*)**:**

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:

- What are two ways to think about dividing by a fraction?
- How are division and multiplication related to each other?
- In what situations would there be fraction-sized groups or a number of groups that is a fraction?

Unit Enduring Understandings:

Dividing by a fraction can be understood as either finding how many of the fraction fit into a whole or how much is in one group when a whole is split into fractional parts.

Division and multiplication are inverse operations; understanding one helps make sense of the other,

	especially when working with fractions. Fractional groups occur in real-world situations when quantities are shared, measured, or divided in parts, showing that groups and group sizes don't always have to be whole numbers.
Vocabulary: common denominator, quotient, reciprocal	
Students will be able to: ***Lesson 1 "Cookie Cutter"** ***Estimating Quotients*** Revisit the meaning of division by estimating quotients. Building Toward: 6.NS.A.1 MP1 MP3 MP7 **Lesson 2 "Division Meanings"** ***Representing Division Situations*** Make connections between multiplication and division situations and the tape diagrams that represent them. 6.NS.A.1 MP7 **Lesson 3 "Flour Planner"** ***How Many Groups?, Part 1*** Make connections between drawings, tape diagrams, and multiplication and division expressions to answer the question "How many groups?" 6.NS.A.1 MP2 **Lesson 4 "Flower Planters"** ***How Many in Each Group?*** Extend prior knowledge about whole numbers to answer the question "How many in 1 group?" when the number of groups is a fraction. 6.NS.A.1 MP1 MP6 MP8 **Lesson 5 "Garden Bricks"** ***How Many Groups?, Part 2*** Build on prior work using tape diagrams to answer the question "How many groups?" 6.NS.A 6.NS.A.1 MP2 MP3 MP6 **Lesson 6 "Fill the Gap"** ***More or Less Than One Group?*** Extend earlier strategies to calculate an unknown number of groups when there is less than 1 group. 6.NS.A 6.NS.A.1 MP1 MP3 MP7 **Lesson 7 "Break it Down"** ***Using Common Denominators to Divide Fractions*** Develop fluency in using common denominators to divide fractions. 6.NS.A 6.NS.A.1 MP3 MP7 MP8	

Lesson 8 "Potting Soil" ***Dividing by Unit Fractions*** Explore a strategy for dividing by a unit fraction by asking the question "How many in 1 group?" 6.NS.A 6.NS.A.1 MP2 MP8

Lesson 9 "Division Challenges" ***Two Strategies for Dividing Fractions*** Develop fluency with at least one method for dividing fractions. 6.NS.A 6.NS.A.1 MP3

Lesson 10 "Action Fractions" ***Relating Fraction Division to Multiplication*** Develop an algorithm for fraction division. 6.NS.A.1 MP1 MP3 MP8

Lesson 11 "Swap Meet" ***Division of Fractions in Context*** Apply earlier strategies to answer questions in context. 6.NS.A 6.NS.A.1 MP1 MP2 MP7

Lesson 12 "Classroom Comparisons" ***Comparing Fractional Lengths*** Practice dividing fractions by comparing lengths and answering "How many times as long?" questions. 6.NS.A.1 MP1 MP3 MP6

Lesson 13 "Puzzling Areas" ***Areas With Fractional Dimensions*** Apply prior knowledge about multiplying and dividing fractions to a familiar context: calculating area. 6.G.A.1 6.NS.A.1 MP1

Lesson 14 "Volume Challenges" ***Volumes With Fractional Dimensions*** Extend prior knowledge to calculate volumes of rectangular prisms with fractional dimensions. 6.G.A.2 MP3

Learning Activities: DeltaMath

Day 1: *Lesson 1 "Cookie Cutter" *Estimating Quotients*

Day 2: Lesson 2 "Division Meanings" *Representing Division Situations*

Day 3: Lesson 3 "Flour Planner" *How Many Groups?, Part 1*

Day 4: Lesson 4 "Flower Planters" *How Many in Each Group?*

Day 5: Lesson 5 "Garden Bricks" *How Many Groups?, Part 2*

Day 6: Lesson 6 “Fill the Gap” *More or Less Than One Group?*

Used the Warm-Up to practice converting between improper fractions and mixed numbers.

Day 7: Lesson 7 “Break it Down” *Using Common Denominators to Divide Fractions*

Day 8: Lesson 8 “Potting Soil” *Dividing by Unit Fractions*

Day 9: Lesson 9 “Division Challenges” *Two Strategies for Dividing Fractions*

Day 10: Lesson 10 “Action Fractions” *Relating Fraction Division to Multiplication*

Day 11: Lesson 11 “Swap Meet” *Division of Fractions in Context*

Day 12: Practice Day

Day 13: Sub Unit 1 Quiz - Introduction to Dividing Fractions - *No calculator. Students will create and interpret diagrams that represent dividing whole numbers by fractions. Students will use a variety of strategies to calculate quotients of fractions and solve problems that involve dividing fractions.

Day 14: Lesson 12 “Classroom Comparisons” *Comparing Fractional Lengths*

Day 15: Lesson 13 “Puzzling Areas” *Areas With Fractional Dimensions*

Day 16: Lesson 14 “Volume Challenges” *Volumes With Fractional Dimensions*

Day 17: Amplify “Practice Day 2”

Day 18: Amplify Unit 4 Test - Followed by Unit 5 Pre-Unit Check

**Additional Activities are available in a Math 6 Amplify Desmos Unit 4 Teacher Curriculum Resources Folder.

The following activities will be used to supplement learning:

- DeltaMath practice based on each lesson. DeltaMath includes a variety of interactive features and student response types which enable teachers to effectively scaffold and differentiate concepts to meet the needs of

all students. Students will work in DeltaMath completing recommended skills from their teacher and based on their diagnostic results.

Amplify Aligned Practice:

- 6.4 Lesson Practice 6.4.01 - 6.4.15
- 6.4 Additional Practice 6.4.01 - 6.4.15
- ML 6.4.04 Mini-Lesson: Determining How Many in Each Group
- ML 6.4.07 Mini-Lesson: Dividing Fractions Using Common Denominators
- ML 6.4.14 Mini-Lesson: Determining the Volume of Prisms with Fractional Dimensions
- 6.4.04 Boost Personalized Learning Activity: Use Diagrams to Represent and Solve Division Problem
- 6.4.16 Boost Personalized Learning Activity: Use Tape Diagrams with Common Denominators to Solve Division Problems
- 6.4 Unit Math Language Development Resources 6.4.01 - 6.4.15
- 6.4 Sub-Unit 1 Extensions: Introduction to Dividing Fractions
- 6.4 Sub-Unit 2 Extensions: Dividing Fractions
- 6.4 Sub-Unit 3 Extensions: Area and Volume With Fractions
- 6.4 Math in Action

DeltaMath Aligned Practice

- **Introduction to Dividing Fractions** (Lessons 1–4)
    - Create and interpret diagrams that represent dividing whole numbers by fractions.
    - Analyze diagrams that represent dividing by fractions.
- **Dividing Fractions** (Lessons 5–11)
    - Use a variety of strategies to calculate quotients of fractions.
    - Solve problems that involve dividing fractions.
- **Area and Volume With Fractions** (Lessons 12–15)
    - Use division of fractions to compare lengths.
    - Solve problems about areas and volumes with fractional dimensions.

Additional Activities

- **Introduction to Dividing Fractions** (Lessons 1–4)
  - Modeling Fractions with Bar Models / Tape Diagrams
  - Fractions as Division Problems with Tape Diagrams
- **Dividing Fractions** (Lessons 5–11)
  - Dividing Fractions Drag & Drop (Slides)
  - Dividing Fractions Digital Sort
  - Dividing Fractions Pixel Art
- **Area and Volume With Fractions** (Lessons 12–15)
  - Volume Maze
  - Volume Scavenger Hunt

Assessment Evidence
Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz, Show What You Know, DeltaMath
Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Units 1-4 Benchmark
Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • a classroom object in the form of a rectangular prism (as needed) (Lesson 14) • classroom objects (optional) (Lesson 12) • coloring tools (Lessons 2, 5, 9, 12–13, 15) • cut-out rectangles (as needed) (Lesson 6) • index cards or slips of paper (Lesson 11) • poster paper (Lesson 15) • unit cubes (as needed) (Lesson 14) • various measuring scoops, flour, a large container (optional) (Lesson 3)

Delta Math, Khan Academy,LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:
Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

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English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

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Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice
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-Enrichment/Extension Activities within Digital Platforms such as Link It assignments

Unit 5

Desired Results

Unit 5 Title: Decimal Arithmetic

Unit Summary: Students develop and use a variety of strategies for adding, subtracting, multiplying, and dividing decimals.

Sub-Unit 1: Adding and Subtracting Decimals (Lessons 1–4)

- Add and subtract multi-digit decimals using a variety of strategies.
- Explain how to attend to place value when adding and subtracting multi-digit decimals.

Sub-Unit 2: Multiplying Decimals (Lessons 5–8 + Practice Day + Quiz)

- Multiply multi-digit decimals using a variety of strategies.
- Compare and contrast different strategies for multiplying multi-digit decimals.

Sub-Unit 3: Division and Dividing Decimals (Lessons 9–13 + Practice Day + Quiz)

- Divide multi-digit numbers with and without remainders using long division.
- Compare and contrast different strategies for dividing multi-digit decimals.

Sub-Unit 4: Solving Problems With Decimals (Lessons 14–16 + Practice Day)

- Use decimal operations to solve problems in context.
- Explain how operations with decimals relate to real-world problems.

Learning Standards

NJSLS Math:

6.NS The Number System

6.NS.B Compute fluently with multi-digit numbers & find common factors & multiples

NS.B.2 With accuracy and efficiency, divide multi-digit numbers using the standard algorithm.

NS.B.3 With accuracy and efficiency, add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

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 $4(9 + 2)$.

6. RP Ratios and Proportional Relationships

RP.A. Understand ratio concepts and use ratio reasoning to solve problems

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.

RP.A.3.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?*

RP.A.3.c. Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means $\frac{30}{100}$ times the quantity); solve problems involving finding the whole, given a part and the percent.

Math Practices: MP1, MP2, MP3, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking (*CS & DT***):**

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
How do the place values in each decimal number in a calculation affect the place value of the result? How are strategies for multiplying decimals like strategies for dividing decimals? How are they different?	The place value of each digit in a decimal number plays a key role in determining the value of the result in calculations, helping ensure accuracy when multiplying or dividing. Strategies for multiplying and dividing decimals often rely on understanding place value and using similar steps, like ignoring the decimal temporarily and placing it correctly at the end. However, the operations

	differ in how the decimal point is placed in the final answer and how the numbers are scaled.
Vocabulary: place value, multi-digit numbers, distributive property, long division	
Students will be able to: ***Lesson 1 "Dishing Out Decimals"** ***Reasoning With Decimals*** Surface different ways to reason about decimals by estimating the cost to make various dishes. Building Toward 6.NS.B.3 MP2 MP3 **Lesson 2 "Decimal Diagrams and Algorithms"** ***Representing Decimals*** Make connections between diagrams, place value, and the decimal representation of numbers. 6.NS.B.3 MP3 MP6 **Lesson 3 "Fruit by the Pound"** ***Adding and Subtracting Decimals, Part 1*** Add and subtract decimals by making connections between place value thinking, diagrams, and vertical calculations. 6.NS.B.3 MP3 MP6 **Lesson 4 "Missing Digits"** ***Adding and Subtracting Decimals, Part 2*** Develop fluency with adding and subtracting decimals using vertical calculations. 6.NS.B.3 MP3 MP6 MP8 **Lesson 5 "Decimal Multiplication"** ***Introduction to Multiplying Decimals*** Reason about place value when multiplying with one non-zero digit. 6.NS.B.3 MP1 MP8 **Lesson 6 "Garden Arrangements"** ***Factors and Expressions*** Use area models to write equivalent expressions. 6.NS.B.4 MP1 MP3 ***Lesson 7 "Multiplying With Areas"** ***Using Area Models to Multiply Decimals*** Use area models to multiply decimals with more than one non-zero digit. 6.NS.B.3 MP1 MP3 MP6 **Lesson 8 "Multiplication Methods"** ***Using Place Value to Multiply Decimals*** Make sense of multiplying decimals using multiple strategies. 6.NS.B.3 MP5 MP7 MP8	

Lesson 9 "Quotient Quest" ***Dividing Whole Numbers Using Partial Quotients*** Analyze two methods for determining the quotient of whole numbers: area models and partial quotients. 6.NS.B.2 MP3 MP6

Lesson 10 "Just Keep Dividing" ***Dividing Whole Numbers Using Long Division*** Connect the partial quotient strategies to long division including decomposing ones into tenths. 6.NS.B.2 MP1

Lesson 11 "Division Diagrams" ***Making Sense of Decimal Division*** Make sense of dividing decimals using tenths and hundredths charts. 6.NS.B.3 MP1 MP3 MP5

Lesson 12 "Return of the Long Division" ***Long Division With Decimal Quotients*** Rewrite decimal division expressions using whole numbers, then divide using long division or partial quotients. 6.NS.B.2 6.NS.B.3 MP5 MP7

Lesson 13 "Movie Time"** ***Dividing Decimals in Context Practice dividing decimals to solve problems. 6.NS.B.2 6.NS.B.3 MP1

Lesson 14 "Budget Vehicles" ***Operations With Decimals in Context*** Practice skills involving operations with decimals. 6.NS.B.3, 6.RP.A.3.B, MP4

Lesson 15 "Coining New Representations" ***Percentages, Decimals, and Fractions*** Solve problems using percents by rewriting them as decimals. 6.RP.A.3.C, MP8

Lesson 16 "Grocery Prices" ***Percentages as Decimals*** Apply knowledge about decimals and percentages to explore prices of groceries in different cities. 6.RP.A.3.C, MP1, MP2, MP3

**Optional Lesson*

Learning Activities:

Day 1: *Lesson 1 "Dishing Out Decimals" *Reasoning With Decimals*

Day 2: Lesson 2 “Decimal Diagrams and Algorithms” *Representing Decimals*

Day 3: Lesson 3 “Fruit by the Pound” *Adding and Subtracting Decimals, Part 1*

Day 4: Lesson 4 “Missing Digits” *Adding and Subtracting Decimals, Part 2*

**Great lesson for a challenge.

Day 5: Lesson 5 “Decimal Multiplication” *Introduction to Multiplying Decimals*

Day 6: Lesson 6 “Garden Arrangements” *Factors and Expressions*

Day 7: *Lesson 7 “Multiplying With Areas” *Using Area Models to Multiply Decimals*

Use Mini Lesson to pull a small group at the end based on show what you know results. Hide slides 9-10.

Day 8: Lesson 8 “Multiplication Methods” *Using Place Value to Multiply Decimals*

Use Activity 2 as a Warm-Up/Review of previously learned lessons from this unit. Use the Scavenger Hunt (Activity 3) after reviewing the algorithm with multiplying decimals.

Day 9: Practice Day 1

Day 10: Unit 5 Sub-Unit 1 Quiz

Day 11: Lesson 9 “Quotient Quest” *Dividing Whole Numbers Using Partial Quotients*

Day 12: Lesson 10 “Just Keep Dividing” *Dividing Whole Numbers Using Long Division*

Day 13: Lesson 11 “Division Diagrams” *Making Sense of Decimal Division*

Day 14: Lesson 12 “Return of the Long Division” *Long Division With Decimal Quotients*

Day 15: *Lesson 13 “Movie Time” *Dividing Decimals in Context*

Day 16: Practice Day 2

Day 17: Unit 5 Sub-Unit 2 Quiz

Day 18: Lesson 14 “Budget Vehicles” *Operations With Decimals in Context*

Day 19: Lesson 15 “Coining New Representations” *Percentages, Decimals, and Fractions*

Day 20: Lesson 16 “Grocery Prices” *Percentages as Decimals*

Day 21: Practice Day 3 -- Modified Task D

Day 22: Amplify Unit 5 Test. Followed by Unit 6 Pre-Unit Check

**Additional Activities are available in a Math 6 Amplify Desmos Unit 5 Teacher Curriculum Resources Folder.

Amplify Aligned Practice:

- 6.5 Lesson Practice 6.5.01 - 6.5.16
- 6.5 Additional Practice 6.5.01 - 6.5.16
- ML 6.5.03 Mini-Lesson: Adding and Subtracting Decimals
- ML 6.5.07 Mini-Lesson: Multiplying Decimals Using Area Models
- ML 6.5.12 Mini-Lesson: Dividing Decimals Using Long Division
- ML 6.5.15 Mini-Lesson: Converting Between Fractions, Percents, and Decimals
- 6.5.05 Boost Personalized Learning Activity: Multiply Decimals Using Area Diagrams
- 6.5.11 Boost Personalized Learning Activity: Use Tenths and Hundredths Charts to Divide Decimals
- 6.5 Unit Math Language Development Resources 6.5.01 - 6.5.16
- 6.5 Sub-Unit 1 Extensions: Adding and Subtracting Decimals
- 6.5 Sub-Unit 2 Extensions: Multiplying Decimals
- 6.5 Sub-Unit 3 Extensions: Division and Dividing Decimals
- 6.5 Sun-Unit 4 Extensions: Solving Problems with Decimals
- 6.5 Math in Action

Additional Activities

Amplify Desmos Sub-Unit 1 (Lessons 1-4):

- 6th Grade Adding Decimals Mystery Picture Art
- Adding & Subtracting Decimals Drag and Drop
- Adding & Subtracting Decimals Maze

Amplify Desmos Sub-Unit 2 and 3 (Lessons 5-13):

- Dividing Decimals Riddle Slide
- Multiplying and Dividing Decimals Maze
- Multiplying and Dividing Decimals Gold Digger Self Check
- Dividing Decimals by Decimals Slides

Amplify Desmos Sub-Unit 4 (Lessons 14-16):

- Add, Subtract, Multiply, and Divide Decimals Self-Checking Scramble Pixel Art
- Fractions, Decimals, & Percents - Drag and Drop
- Fractions, Decimals, & Percents Escape Activity

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz, Show What You Know, and assigned skills based on each lesson

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Units 1-5 Benchmark

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • calculators (as needed) (Lessons 4, 11) • coloring tools (Lessons 8–9, 14) • counters (as needed) (Lesson 6) • graph paper (as needed) (Lessons 6, 10) • hundredths charts (Lessons 2–5, 12) • lined paper (as needed) (Lesson 10) • posters (Lesson 14) • several examples of U.S. coins (as needed) (Lesson 15) • straightedges (as needed) (Lessons 6, 10) • U.S. dollar bill (as needed) (Lesson 15) • 100 pennies (as needed) (Lesson 15)(as needed) (Lesson 10) • posters (Lesson 14) • several examples of U.S. coins (as needed) (Lesson 15) • straightedges (as needed) (Lessons 6, 10) • U.S. dollar bill (as needed) (Lesson 15) • 100 pennies (as needed) (Lesson 15)

Khan Academy, Delta Math, LinkIt!

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Alternate or reduced work within Digital Platforms such as Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice
Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as DeltaMath, and Link It assignments

Unit 6

Desired Results

Unit 6 Title: Expressions and Equations

Unit Summary: Students build on their understanding of the equal sign and use it as a representation of equality (or balance), performing balanced operations to solve for unknown values.

Sub-Unit 1: Solving Equations (Lessons 1–5)

- Write and solve equations of the form $x+p=q$ and $px=q$.

Sub-Unit 2: Equivalent Expressions (Lessons 6–9 + Practice Day + Quiz)

- Use properties to write equivalent expressions with variables.

Sub-Unit 3: Expressions Involving Exponents (Lessons 10–12)

- Evaluate numerical and variable expressions with whole number exponents and one or more other operations.

Sub-Unit 4: Introduction to Representing Relationships (Lessons 13–16 + Practice Day)

- Use tables, equations, and graphs to represent relationships.

Learning Standards

NJSLS Math:

6.EE Expressions and Equations

6.EE.A. Apply and extend previous understandings of arithmetic to algebraic expressions

EE.A.1. Write and evaluate numerical expressions involving whole-number exponents.

EE.A.2. Write, read, and evaluate expressions in which letters stand for numbers.

EE.A.2.a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract* y *from 5" as* $5 - y$.

EE.A.2.b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *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.*

EE.A.2.c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas* $V = 6s^3$ *and* $A = 6s^2$ *to find the volume and surface area of a cube with sides of length* $s = \frac{1}{2}$.

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* $3y$.

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.*

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

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.

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.

EE.B.7 Solve real-world and mathematical problems by writing and solving equations of the form $x + p$ and $px = q$ for cases in which p, q, and r are all nonnegative rational numbers.

EE.C Represent and analyze quantitative relationships between dependent and independent variables

EE.C.9 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.*

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

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.

G.A.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas

$V = lwh$ and $V = Bh$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

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

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."*

RP.A.2. Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, 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 ¾-cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."* ***(Clarification: Expectations for unit rates in this grade are limited to non-complex fractions.)***

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.

RP.A.3.a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

Math Practices: MP1, MP2, MP3, MP4, MP5, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking *(CS & DT)*:

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:	**Unit Enduring Understandings:**
• What does it mean for an equation to be true? Can an equation be false? • What does it mean for two expressions to be equivalent? • If multiplication is repeated addition, how do we represent repeated multiplication?	An equation is true when both sides represent the same value. Equations can also be false if the values on each side are not equal. Two expressions are equivalent if they have the same value, even if they look different. Understanding this helps simplify and compare expressions accurately. Repeated multiplication is represented using exponents, which provide a more efficient way to show

	and work with multiplying the same number multiple times.
Vocabulary: base (of a power), coefficient, dependent variable, equivalent expressions, independent variable, perfect cube, perfect square, solution to an equation, term, variable	
Students will be able to: **Lesson 1: "Weight for It"** ***Reasoning About Unknown Values*** Use reasoning, equations, and tape diagrams to determine unknown weights on a seesaw. 6.EE.B.6 6.EE.B.7 MP1 MP2 **Lesson 2: "Five Equations"** ***Tape Diagrams, Equations, Situations*** Connect tape diagrams, equations, and situations, and use them as tools to answer questions in context. 6.EE.B.5 6.EE.B.7 MP1 MP2 **Lesson 3: "Hanging Around"** ***Introduction to Balanced Hangers*** Use hangers to represent equations and then determine unknown values that balance each hanger. 6.EE.B.5 6.EE.B.6 6.EE.B.7 MP6 MP7 **Lesson 4: "Hanging It Up"** ***Solving Equations*** Develop fluency with solving equations, particularly with equations that include decimals and fractions. 6.EE.B.5 6.EE.B.6 6.EE.B.7 MP5 MP7 **Lesson 5: "Swap and Solve"** ***Solving Equations in Context*** Connect equations to situations by writing situations to match equations and then trade situations with classmates. 6.EE.B.6 6.EE.B.7 MP1 MP2 MP6 **Lesson 6: "Vari-apples"** ***Introduction to Variable Expressions*** Use expressions with variables to represent situations (in this case, the cost of some number of pounds of fruit). 6.EE.A.2.A 6.EE.B.6 6.RP.A.3.A MP2 MP3 MP6 **Lesson 7: "Border Tiles"** ***Equivalent Expressions*** Explore the concept of equivalent expressions (two different expressions that describe the same thing) in the context of the number of tiles that border a square. 6.EE.A.2.C 6.EE.A.3 6.EE.A.4 MP3 MP7	

Lesson 8: "Products and Sums" ***Distributive Property, Part 1*** Use variable expressions to represent areas of rectangles in two different ways: as the sum of two areas and as the product of the two side lengths. 6.EE.A.2.B 6.EE.A.3 6.EE.A.4 MP3

Lesson 9: "Equivalent Expressions" ***Distributive Property, Part 2*** Extend understanding of equivalent expressions to expressions with the distributive property and other operations. 6.EE.A.2.A 6.EE.A.2.B 6.EE.A.3 6.EE.A.4 MP3

Lesson 10: "Powers" ***What Are Exponents?*** Make sense of exponents, both when the base is a whole number and when it is a fraction. 6.EE.A.1 MP3 MP7 MP8

Lesson 11: "Exponent Expressions" ***Exponents and Order of Operations*** Use areas to make sense of more complex expressions with exponents, particularly evaluating expressions that include an exponent and one other operation. 6.EE.A.1 6.EE.A.2.C MP1 MP3 MP7

Lesson 12: "Squares and Cubes" ***Exponent Expressions With Variables*** Extend understanding of numerical expressions with exponents to evaluate variable expressions that involve exponents and other operations. 6.EE.A.2 6.EE.A.2.C 6.G.A.1 6.G.A.2 MP3 MP6 MP7

Lesson 13: "Turtles All the Way" ***Stories and Tables and Variables*** Use both tables and equations to represent relationships and use the terms independent variable and dependent variable to describe each part of a relationship. 6.EE.C.9 MP1 MP3

Lesson 14: "Representing Relationships" ***Interpreting Graphs of Relationships*** Introduction to graphs as a way of representing relationships between two variables. 6.EE.C 6.EE.C.9 MP3 MP6

Lesson 15: "Connecting Representations" ***Tables, Equations, and Graphs of Relationships*** Make connections between different representations of the same relationship. 6.EE.C 6.EE.C.9 6.RP.A.1 6.RP.A.2 6.RP.A.3 6.RP.A.3.A MP3 MP6

Lesson 16: "Subway Fares" ***Applying Relationships*** Use tables, graphs, and equations to help customers make decisions about what type of transportation ticket to buy. 6.EE.B.6 6.EE.C 6.EE.C.9 6.RP.A.2 6.RP.A.3 MP3 MP6

Learning Activities:

**Additional Activities are available in a Math 6 Amplify Desmos Unit 6 Teacher Curriculum Resources Folder.

Day 1: Lesson 1: "Weight for It" *Reasoning About Unknown Values*
Day 2: Lesson 2: "Five Equations" *Tape Diagrams, Equations, Situations*
Day 3: Lesson 3: "Hanging Around" *Introduction to Balanced Hangers*
Day 4: Lesson 4: "Hanging It Up" *Solving Equations*
Day 5: Lesson 5: "Swap and Solve" *Solving Equations in Context*
Day 6: Lesson 6: "Vari-apples" *Introduction to Variable Expressions*
Day 7: Lesson 7: "Border Tiles" *Equivalent Expressions*
Day 8: Lesson 8: "Products and Sums" *Distributive Property, Part 1*
Day 9: Lesson 9: "Equivalent Expressions" *Distributive Property, Part 2*
Day 10: Practice Day 1
Day 11: Sub-Unit 1 Quiz
Day 12: Lesson 10: "Powers" *What Are Exponents?*
Day 13: Lesson 11: "Exponent Expressions" *Exponents and Order of Operations*
Day 14: Lesson 12: "Squares and Cubes" *Exponent Expressions With Variables*
Day 15: Lesson 13: "Turtles All the Way" *Stories and Tables and Variables*
Day 16: Lesson 14: "Representing Relationships" *Interpreting Graphs of Relationships*
Day 17: Lesson 15: "Connecting Representations" *Tables, Equations, and Graphs of Relationships*
Day 18: Lesson 16: "Subway Fares" *Applying Relationships*
Day 19: Practice Day 2
Day 20: Amplify Unit 6 Test. Followed by Unit 7 Pre-Unit Check

Amplify Aligned Practice:

- 6.6 Lesson Practice 6.6.01 - 6.6.16
- 6.6 Additional Practice 6.6.01 - 6.6.16
- ML 6.6.05 Mini-Lesson: Writing and Solving Equations
- ML 6.6.08 Mini-Lesson: Writing Equivalent Expressions Using the Area Model
- ML 6.6.11 Mini-Lesson: Evaluating Expressions With Exponents
- ML 6.6.14 Mini-Lesson: Interpreting Graphs
- 6.6.08 Boost Personalized Learning Activity: Writing Equivalent Expressions Using the Area Model
- 6.6.10 Boost Personalized Learning Activity: Equivalent Expressions with Exponents
- 6.6 Unit Math Language Development Resources 6.6.01 - 6.6.16
- 6.6 Sub-Unit 1 Extensions: Solving Equations
- 6.6 Sub-Unit 2 Extensions: Equivalent Expressions
- 6.6 Sub-Unit 3 Extensions: Expressions Involving Exponents
- 6.6 Sub-Unit 4 Extensions: Introduction to Representing Relationships
- 6.6 Math in Action

Additional Activities

<u>Amplify Desmos Sub-Unit 1 (Lessons 1-5):</u>

- Adding and Subtracting One-Step Equations Maze
- Multiplying and Dividing One_Step Equations Maze
- Solving One-Step Equations Mixed Maze
- Solving Equations Puzzle Activity
- One-Step Equations Scavenger Hunt
- Translating One-Step Equations Bubble Gum Activity
- Students may solve real-world problems by writing and solving one-variable equations related to deforestation and/or increasing livestock farming as contributors to climate change. **6.EE.B.7**

<u>Amplify Desmos Sub-Unit 2 (Lessons 6-9):</u>

- Algebraic Expressions Matching Slides
- Distributive Property Factoring Sort
- Writing Algebraic Expressions Maze
- Factoring Mystery Picture Reveal

Amplify Desmos Sub-Unit 3 (Lessons 10-12):

- Order of Operations Matching Activity
- Order of Operations with Exponents Maze
- Order of Operations Puzzle Mystery Image
- Order of Operations with Decimals Riddles (Slides)

Amplify Desmos Sub-Unit 4 (Lessons 13-16):

- 'Variable Equations and Tables Maze
-  Students may analyze and use variables to represent the relationship between greenhouse emissions and livestock farming when representing relationships among contributors to climate change. **6.EE.C.9**

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz, Show What You Know, and assigned skills based on each lesson

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Units 1-6 Benchmark

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • algebra tiles (as needed) (Lessons 7–8) • calculators (as needed) (Lesson 6) • chips (as needed) (Lesson 4) • coins (as needed) (Lesson 4) • clothes on hangers (as needed) (Lesson 3) • coloring tools (as needed) (Lesson 15) • graph paper (as needed) (Lessons 7, 12, 15–16) • highlighters (as needed) (Lessons 7, 15) • index cards or slips of paper (Lesson 5) • large paper (optional) (Lesson 16)

Delta Math, Khan Academy, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:
Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

Specific Strategies and Practices that Support English Language Learners

English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension - Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups
Alternate or reduced work within Digital Platforms such as Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice
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Unit 7

Desired Results

Unit 7 Title: Positive and Negative Numbers

Unit Summary: Students explore positive and negative numbers in several ways: on a number line, represented as inequalities, and on the coordinate plane.

Sub-Unit 1: Negative Numbers and Absolute Values (Lessons 1–6 + Practice Day + Quiz)

- Order and compare positive numbers, negative numbers, and `0`.
- Evaluate, order, and compare absolute values.

Sub-Unit 2: Inequalities (Lessons 7–9)

- Write inequalities using symbols, words, and graphs.
- Graph solutions to inequalities on a number line.

Sub-Unit 3: The Coordinate Plane (Lessons 10–13 + Practice Day)

- Graph points with positive and negative coordinates.
- Draw polygons on the coordinate plane and determine their vertical and horizontal side lengths.

Learning Standards

NJSLS Math:

6.EE Expressions and Equations

EE.B Reason about and solve one-variable equations and inequalities

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.

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.

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.

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

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.

6.NS The Number System

6.NS.C. Apply and extend previous understandings of numbers to the system of rational numbers

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.

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

NS.C.6.a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., –(–3) = 3, and that 0 is its own opposite.

NS.C.6.b Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.

NS.C.6.c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.

N.S.C.7 Understand ordering and absolute value of rational numbers.

NS.C.7.a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret that −3 is located to the right of −7 on a number line oriented from left to right.*

NS.C.7.b Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write* $-\ 3C^{o} > -\ 7C^{o}$ *to express the fact that* $-\ 3C^{o}$ *is warmer than* $-\ 7C^{o}$.

NS.C.7.c Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real- world situation. *For example, for an account balance of* $-\ 30$ *dollars, write* $|-\ 30| = 30$ *to describe the size of the debt in dollars.*

NS.C.7.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.*

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.

Math Practices: MP1, MP2, MP3, MP4, MP6, MP7, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
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9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking (*CS & DT***):**

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:

- What does it mean for a value to be less than zero?
- How do we represent all the numbers that are less than or greater than a value?
- How do we represent points with negative numbers on a coordinate plane?

Unit Enduring Understandings:

A value less than zero is called a negative number and represents quantities like losses, temperatures below freezing, or positions below a reference point.

Numbers that are less than or greater than a given value can be represented using inequalities and number lines, which help us compare and order values.

Points with negative numbers on a coordinate plane are located to the left or below the origin, and understanding all four quadrants helps us describe locations in a two-dimensional space.

Vocabulary: absolute value, negative number, opposite, positive number, sign, solution to an inequality, coordinate plane, quadrant

Students will be able to:

Lesson 1: "Can You Dig It?" ***Positive and Negative Numbers:*** Use positive and negative numbers to find sand dollars on a horizontal number line. 6.NS.C.5 6.NS.C.6.C 6.NS.C MP3 MP6

Lesson 2: "Digging Deeper" ***Positions on the Number Line:*** Describe and use strategies for identifying and plotting negative rational numbers on the number line. 6.NS.C.6.A 6.NS.C.6.C 6.NS.C 6.NS.C6. MP1 MP7

Lesson 3: "Sub-Zero" ***Positive and Negative Numbers in Context:*** Apply understanding of positive and negative numbers in the contexts of elevations and temperatures around the world. 6.NS.C.5 6.NS.C.7.B 6.NS.C.6.C MP2 MP3 MP7

Lesson 4: "Order in the Class" ***Comparing Numbers:*** Practice comparing positive and negative numbers in a social way. 6.NS.C.6.C 6.NS.C.7 6.NS.C.6.A 6.NS.C.7.A MP7 MP8

Lesson 5: "Distance on the Number Line" ***Introduction to Absolute Value:*** Introduce absolute value and practice comparing values and absolute values through puzzles. 6.NS.C.7.C 6.NS.C.7 6.NS.C.7.A MP2 MP3 MP6

Lesson 6: "We've Got Game(s)" ***Comparing Numbers and Distances From Zero:*** Apply understanding of absolute value and ordering values to real world scenarios. 6.NS.C.7.C 6.NS.C.7.D 6.NS.C.5 6.NS.C.7 MP2 MP3 MP4

Lesson 7: "Tunnel Travels" ***Graphing Inequalities:*** Introduce inequalities with variables and connect verbal descriptions, symbols, and number line representations of inequalities. 6.EE.B.8 MP2 MP3 MP8

Lesson 8: "Shira's Solutions" ***Solutions to Inequalities:*** Consolidate and apply what students have learned about inequalities on the number line and learn the term solution to an inequality. 6.EE.B.5 6.EE.B.6 6.EE.B.8 MP3 MP6

Lesson 9: "Comparing Weights" ***Writing Inequalities:*** Use the hanger representation from earlier in Grade 6 to interpret and write inequalities that involve one variable and more than one variable. 6.EE.B 6.EE.B.6 6.EE.B.8 MP2 MP3

Lesson 10: "Sand Dollar Search" ***Points in the Coordinate Plane:*** Develop an understanding of negative numbers in the coordinate plane. 6.NS.C.6.B 6.NS.C.6.C MP3 MP7

Lesson 11: "The A-maze-ing Coordinate Plane" ***Practice Plotting:*** Practice plotting points in the context of solving mazes, using different scales for the axes and patterns in coordinates that differ only by the sign. 6.NS.C.6.B 6.NS.C.6.C 6.NS.C.8 MP3 MP6 MP7

Lesson 12: "Polygon Maker" ***Polygons in the Plane:*** Apply coordinates with positive and negative numbers to create polygons and determine distances in the coordinate plane. 6.NS.C.8 6.G.A.3 MP1 MP6 MP7

Lesson 13: "Graph Telephone" ***The Coordinate Plane in Context:*** Plot and interpret coordinates in order to make sense of situations in context. 6.NS.C.8 6.NS.C.6.C MP1 MP2 MP6

Learning Activities:

**Additional Activities are available in a Math 6 Amplify Desmos Unit 7 Teacher Curriculum Resources Folder.

Day 1: Lesson 1: "Can You Dig It?" *Positive and Negative Numbers:*
Day 2: Lesson 2: "Digging Deeper" *Positions on the Number Line:*
Day 3: Lesson 3: "Sub-Zero" *Positive and Negative Numbers in Context:*
Day 4: Lesson 4: "Order in the Class" *Comparing Numbers:*
BTC lesson
Day 5: Lesson 5: "Distance on the Number Line" *Introduction to Absolute Value:*
Day 6: Lesson 6: "We've Got Game(s)" *Comparing Numbers and Distances From Zero:*
Day 7: Practice Day 1
Day 8: Sub-Unit 1 Quiz
Day 9: Lesson 7: "Tunnel Travels" *Graphing Inequalities:*
Day 10: Lesson 8: "Shira's Solutions" *Solutions to Inequalities:*
Day 11: Lesson 9: "Comparing Weights" *Writing Inequalities:*
Day 12: Lesson 10: "Sand Dollar Search" *Points in the Coordinate Plane:*
Day 13: Lesson 11: "The A-maze-ing Coordinate Plane" *Practice Plotting:*
Day 14: Lesson 12: "Polygon Maker" *Polygons in the Plane:*
Day 15: Lesson 13: "Graph Telephone" *The Coordinate Plane in Context:*
Day 16: Practice Day 2
Day 17: Amplify Unit 7 Test. Followed by Unit 8 Pre-Unit Check

Amplify Aligned Practice:

- 6.7 Lesson Practice 6.7.01 - 6.7.13
- 6.7 Additional Practice 6.7.01 - 6.7.13
- ML 6.7.04 Mini-Lesson: Ordering and Comparing Positive and Negative Numbers
- ML 6.7.08 Mini-Lesson: Identifying Solutions to Inequalities
- ML 6.7.11 Mini-Lesson: Plotting Points on the Coordinate Plane
- 6.7.07 Boost Personalized Learning Activity: Graphing Inequalities on a Number Line
- 6.7.10 Boost Personalized Learning Activity: Points on the Coordinate Plane
- 6.7 Unit Math Language Development Resources 6.7.01 - 6.7.13
- 6.7 Sub-Unit 1 Extensions: Negative Numbers and Absolute Value
- 6.7 Sub-Unit 2 Extensions: Inequalities
- 6.7 Sub-Unit 3 Extensions: The Coordinate Plane
- 6.7 Math in Action

Additional Activities

<u>Amplify Desmos Sub-Unit 1 (Lessons 1-6):</u>

- Integer Key Words Card Sort
- Integer Key Word Coloring Worksheet
- Integers in Real Life Digital Picture
- Absolute Value Progression Art
- Absolute Value & Opposites Digital Picture
- Absolute Value Mazes
- Comparing and Ordering Integers Maze
- Comparing Integers Digital Activity

<u>Amplify Desmos Sub-Unit 2 (Lessons 7-9):</u>

- Writing Inequalities Slides
- Writing and Graphing Inequalities Activity (Slides)

- Graphing Inequalities Mystery Picture
- Inequality Stations
- Graphing Inequalities Digital Color by Number
- Solutions to Inequalities Maze
- Graphing Inequalities Maze
- Real World Inequalities Card Sort
- Translating Inequalities Matching Slides

Amplify Desmos Sub-Unit 3 (Lessons 10-13):

- Identifying Coordinates (-5 to 5 & -10 to 10)
- Coordinate Grid Activity
- Reflections Digital Activity
- Ghostbusters Coordinate Plane
- Distance Between Points Digital Activity

Assessment Evidence
Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz, Show What You Know, and assigned skills based on each lesson
Summative Assessments: End-of-Unit Assessment
Common Benchmark Assessments: Units 1-7 Benchmark
Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • measuring tapes or meter sticks (optional) (Lesson 7) • rulers (Lessons 10–13)

Delta Math, Khan Academy, LinkIt!

Accommodations and Modifications: Students with Disabilities, English Language Learners, Students at Risk of Failure, Students with 504s, Gifted & Talented Students

Specific Strategies and Practices that Support Students with Disabilities:
Students receiving Special Education programming have specific goals and objectives, as well as accommodations and modifications outlined within their Individualized Education Plans (IEP) due to an identified disability and/or diagnosis. In addition to exposure to the general education curriculum, the instruction is differentiated based upon the student's needs. The IEP acts as a supplemental curriculum guide inclusive of instructional strategies that support each learner.

- Small group/One to one - Additional time - Review of directions - Student restates information - Space for movement or breaks - Extra visual and verbal cues and prompts - Preferential seating - Follow a routine/schedule - Rest breaks - Verbal and visual cues regarding directions and staying on task - Checklists - Immediate feedback Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

Specific Strategies and Practices that Support English Language Learners
English language learner (ELL) is a national-origin-minority student who is limited-English-proficient. This term is often preferred over limited-English-proficient (LEP) as it highlights accomplishments rather than deficits.

- Pre-teaching of vocabulary and concepts - Personal Glossary - Extended Time - Simplified/Verbal Instructions - Frequent Breaks - Visual learning, including graphic organizers - Use of cognates to increase comprehension -

Teacher modeling - Pairing students with beginning English language skills with students who have more advanced English language skills - Scaffolding - Word walls - Think-pair-share - Cooperative learning groups
Alternate or reduced work within Digital Platforms such as DeltaMath, and Link It assignments

Students at Risk of Failure

- Home/School Connection - Alternative Assessments - Learning Contracts - Homogenous Grouping - Supplemental Instruction - Think-Pair-Share by Readiness - Homework Options - Differentiated Online Practice - Leveled Rubrics - Tiered Level of Supports - Tiered Activities - Small Group Instruction - Work Alone Choice - Group Work Choice
Alternate or reduced work within Digital Platforms such as Link It assignments - Opportunities for make-up work or reduce number of assignments - Provide access to extra help when possible

Students with 504 Plans

Teachers are responsible for implementing designated services and strategies identified on a student's 504 Plan.
504 plans are formal plans that schools develop to give kids the support they need and covers any condition that limits daily activities in a major way. Students' accommodations are outlined in their individual 504 plan. -

Specific Strategies and Practices that Support Gifted & Talented Students

It is critical that all teachers are able to recognize a high-ability student who may need more depth and complexity in instruction.

-Homogenous Grouping - Small Group In-Depth Instruction - Differentiated Online Practice - Alternative Assessments - Pre-Assess to provide Differentiated Instruction to Accelerate Learning
-Enrichment/Extension Activities within Digital Platforms such as Delta Math, and Link It assignments

Unit 8

Desired Results

Unit 8 Title: Describing Data

Unit Summary: Students visualize data using dot plots and histograms, then calculate measures of center — mean and median — and measures of variability — mean absolute deviation (MAD), range, and interquartile range (IQR).

Sub-Unit 1: Visualizing Data (Lessons 1–6)

- Use dot plots and histograms to make claims about data.
- Create dot plots and histograms to visualize data.

Sub-Unit 2: Measuring Data: Mean and MAD (Lessons 7–10 + Practice Day + Quiz)

- Calculate the mean and mean absolute deviation (MAD) of a data set.

Sub-Unit 3: Measuring Data: Median and IQR (Lessons 11–16 + Practice Day)

- Calculate the quartiles, interquartile range (IQR), and range of a data set.
- Create and use box plots to make claims about data.

Learning Standards

NJSLS Math:
6.SP Statistics and Probability
SP.A. Develop understanding of statistical variability

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.*

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.

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.

SP.B. Summarize and describe distributions
SP.B.4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

SP.B.5. Summarize numerical data sets in relation to their context, such as by:

SP.B.5.a. Reporting the number of observations.

SP.B.5. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

SP.B.5.c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

SP.B.5.d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Math Practices: MP1, MP2, MP3, MP4, MP6, MP8

Interdisciplinary Connections

Career Readiness, Life Literacies, & Key Skills *(CLKS)*:

9.4.8.CT.2: Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option (e.g., MSETS1-4, 6.1.8.CivicsDP.1).
9.4.8.GCA.2: Demonstrate openness to diverse ideas and perspectives through active discussions to achieve a group goal. searching for information.
9.4.8.IML.2: Identify specific examples of distortion, exaggeration, or misrepresentation of information.
9.4.8.IML.3: Create a digital visualization that effectively communicates a data set using formatting techniques such as form, position, size, color, movement, and spatial grouping (e.g., 6.SP.B.4, 7.SP.B.8b).
9.4.8.IML.4: Ask insightful questions to organize different types of data and create meaningful visualizations. • 9.4.8.IML.5: Analyze and interpret local or public data sets to summarize and effectively communicate the data.

Computer Science & Design Thinking ***(****CS & DT****)*:

8.1.8.CS.1: Recommend improvements to computing devices in order to improve the ways users interact with the devices.
8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Learning Targets

Unit Essential Questions:

- What are statistical questions and how are they used?
- What are different ways to represent numerical data?
- How do we measure the center of a data set?
- How do we measure the spread of a data set?

Unit Enduring Understandings:

Statistical questions involve collecting and analyzing data that can vary, and they help us make sense of real-world situations by identifying patterns or trends.

Numerical data can be represented in multiple ways—such as tables, line plots, histograms, and box

	plots—to highlight different aspects of the data and make it easier to interpret. The center of a data set can be measured using the mean, median, or mode, each giving different insights about the "typical" value in the data. The spread of a data set shows how much the data varies and can be measured using range and interquartile range (IQR), which help us understand the consistency or variability of the data.
Vocabulary: absolute deviation, bin (of a histogram), box plot, categorical data, center, dot plot, histogram, interquartile range (IQR), mean (average), mean absolute deviation (MAD), median, numerical data, quartile, range, shape, spread, statistic, statistical question	
Students will be able to: **Lesson 1: "Screen Time"** ***Asking Questions, Collecting Data, and Making Claims*** Begin the unit by making connections between questions, claims, and two types of data. 6.SP.A 6.SP.B.5 6.SP.B.5.B MP3 MP6 **Lesson 2: "Dot Plots"** ***Visualizing Data With Dot Plots*** Interpret dot plots and understand what is meant by the term statistical question. 6.SP.A.1 6.SP.B.4 6.SP.B.5 6.SP.B.5.A 6.SP.B.5.B MP1 MP3 MP6 **Lesson 3: "Minimum Wage"** ***Create Dot Plots*** Create dot plots to visualize data sets while attending to precision. 6.SP.B 6.SP.B.4 MP6 **Lesson 4: "Lots More Dots"** ***Comparing Dot Plots*** Describe data about minimum hourly wages by its center, shape, and spread. 6.SP.A.2 6.SP.B 6.SP.B.4 MP3	

Lesson 5: "The Plot Thickens" ***Introduction to Histograms*** Explore a new way to visualize data: in a histogram. 6.SP.B.4 6.SP.B.5 6.SP.B.5.A MP1 MP3

Lesson 6: "DIY Histograms" ***Creating Histograms*** Create histograms by hand and use histograms to compare data sets. 6.SP.A.2 6.SP.B.4 6.SP.B.5 6.SP.B.5.A MP1 MP2 MP3

Lesson 7: "Snack Time" ***Introduction to the Mean*** Explore mean as an equal share and make sense of mean as a measure of center. 6.SP.A.3 6.SP.B.5 6.SP.B.5.C MP3 MP6 MP8

Lesson 8: "Pop It!" ***Sum of the Deviations*** Apply a new property of the mean: the sums of the absolute deviations on the left and on the right of the mean are equal. 6.SP.A.3 6.SP.B.5 6.SP.B.5.C MP2 MP3 MP6

Lesson 9: "Hoops" ***Mean Absolute Deviation (MAD)*** Calculate the mean absolute deviation (MAD) of a data set and make sense of MAD as a measure of spread. 6.SP.A.2 6.SP.A.3 6.SP.B.5 6.SP.B.5.C MP2 MP6

Lesson 10: "Hollywood, Part 1" ***Using Mean and MAD to Analyze Actor Salaries*** Compare real-world data sets about actor salaries using the means and mean absolute deviations (MADs). 6.SP.A.3 6.SP.B.5 6.SP.B.5.C MP1 MP3

Lesson 11: "Toy Cars" ***Introducing the Median*** Explore a new measure of center: the median. 6.SP.B.4 6.SP.B.5 6.SP.B.5.C MP2 MP3

Lesson 12: "In the News" ***Comparing Measures of Center*** Investigate how the shape of a data set affects the mean and median, and decide which measure of center best describes the data. 6.SP.B.4 6.SP.B.5 6.SP.B.5.D MP2 MP3 MP6

Lesson 13: "Pumpkin Patch" ***Introduction to Quartiles*** Understand what is meant by quartiles and why they are useful when describing data. 6.SP.A.3 6.SP.B.5 6.SP.B.5.C MP3 MP6 MP8

Lesson 14: "Car, Plane, Bus, or Train?" ***Box Plots, IQR, and Range*** Explore a new way to visualize data: a box plot, and two new measures of spread: range and interquartile range (IQR). 6.SP.A.2 6.SP.A.3 6.SP.B.4 6.SP.B.5 6.SP.B.5.C MP1 MP4

Lesson 15: "Hollywood, Part 2" ***Making Claims Using Box Plots*** Interpret box plots in order to make and evaluate claims about original animated movies and sequels. 6.SP.A.3 6.SP.B 6.SP.B.5 6.SP.B.5.B MP3 MP4

Lesson 16: "Hollywood, Part 3" ***Using Statistics to Analyze Movies*** Use statistics and visual representations to compare the percentage of words spoken by women and men in top-grossing movies. 6.SP.A.3 6.SP.B 6.SP.B.4 6.SP.B.5 6.SP.B.5.D MP3 MP4

Learning Activities:

**Additional Activities are available in a Math 6 Amplify Desmos Unit 8 Teacher Curriculum Resources Folder.

Day 1: Lesson 1: "Screen Time" *Asking Questions, Collecting Data, and Making Claims*
Day 2: Lessons 2 & 3: "Dot Plots" *Visualizing Data With Dot Plots &*"Minimum Wage" *Create Dot Plots*
Day 3: Lesson 4: "Lots More Dots" *Comparing Dot Plots*
Day 4: Lessons 5 & 6: "The Plot Thickens" *Introduction to Histograms &* "DIY Histograms" *Creating Histograms*
Day 5: Quiz - Sub-Unit 1
Day 6: Lesson 7: "Snack Time" *Introduction to the Mean*
Day 7: Lesson 8: "Pop It!" *Sum of the Deviations*
Day 8: Lesson 9: "Hoops" *Mean Absolute Deviation (MAD)*
Day 9: Lesson 10: "Hollywood, Part 1" *Using Mean and MAD to Analyze Actor Salaries*
Day 10: Practice Day 1
Day 11: Sub-Unit 2 Quiz
Day 12: Lesson 11: "Toy Cars" *Introducing the Median*
Day 13: Lesson 12: "In the News" *Comparing Measures of Center*
Day 14: Lesson 13: "Pumpkin Patch" *Introduction to Quartiles*
Day 15: Lesson 14: "Car, Plane, Bus, or Train?" *Box Plots, IQR, and Range*
Day 16: Lesson 15: "Hollywood, Part 2" *Making Claims Using Box Plots*
Day 17: Lesson 16: "Hollywood, Part 3" *Using Statistics to Analyze Movies*
Day 18: Practice Day 2
Day 19: Amplify Unit 8 Test

Amplify Aligned Practice:

- 6.8 Lesson Practice 6.8.01 - 6.8.16
- 6.8 Additional Practice 6.8.01 - 6.8.16
- ML 6.8.03 Mini-Lesson: Creating Dot Plots
- ML 6.8.09 Mini-Lesson: Calculating Mean Absolute Deviation
- ML 6.8.14 Mini-Lesson: Interpreting Box Plots
- 6.8.05 Boost Personalized Learning Activity: Introduction to Histograms
- 6.8.07 Boost Personalized Learning Activity: Calculating Mean
- 6.8 Unit Math Language Development Resources 6.8.01 - 6.8.16
- 6.8 Sub-Unit 1 Extensions: Visualizing Data
- 6.8 Sub-Unit 2 Extensions: Measuring Data: Mean and MAD
- 6.8 Sub-Unit 3 Extensions: Measuring Data: Median and IQR
- 6.8 Math in Action

Additional Activities**

Amplify Desmos Sub-Unit 1 (Lessons 1-6):

- Statistical Question Drag & Drops
- Dot Plot Slides Activity
- Mean, Median, Mode, and Range Mazes
- Histogram Digital Activity
- Mean, Median, Mode, Range (Art)
- Mean, Median, Mode, Range Task Cards
- Students may display numerical data related to deforestation and increasing livestock farming as contributors to climate change in plots on a number line, including dot plots, histograms, and box plots. **6.SP.B.4**

Amplify Desmos Sub-Unit 2 (Lessons 7-10)

- Mean Absolute Deviation Sheet

Amplify Desmos Sub-Unit 3 (Lessons 11-16):

- Box Plot Digital Activity

- Analyzing Digital Activity
- Bow and Whisker Plot Digital Activity
- Box Plot Maze
- Box Plot Digital Activities

Assessment Evidence

Formative Assessments: Pre-Unit Check (optional), Sub-Unit Quiz, Show What You Know, and assigned skills based on each lesson

Summative Assessments: End-of-Unit Assessment

Common Benchmark Assessments: Units 1-8 Benchmark

Alternative Assessments: Modified Unit Assessments, Modified Projects, Other Modified Assessments

Core Instructional & Supplemental Materials

Core Instructional Program: Amplify Desmos Math Online Platform

Desmos Materials by Lesson: • blocks (as needed) (Lesson 13) • calculators (Lessons 7, 10, 12) • chips (as needed) (Lessons 7, 13) • coloring tools (Lessons 4, 8, 14, 16) • counters (Lessons 7, 9) • highlighters (Lessons 5, 8) • paper clips (as needed) (Lesson 7) • posters (Lesson 16) • stopwatches (Lesson 8) • straightedges (Lessons 5–6, 14–15)

Delta Math, Khan Academy, LinkIt!

Accommodations and Modifications:
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Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results

in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4. Model with mathematics

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation

and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well-remembered$7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$ older students can see the 14 as $2 \times 7$and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

8. Look for and express regularity in repeated reasoning

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check

whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $\frac{(y-2)}{(x-1)} = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)\left(x^2 + x + 1\right)$ and $(x - 1)\left(x^3 + x^2 + x + 1\right)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

In Grade 6, instruction focuses broadly on four critical areas:

(1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems;

(2) completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers;

(3) writing, interpreting, and using expressions and equations; and

(4) developing understanding of statistical thinking.

Critical Areas

(1) Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

(2) Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of numbers and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

(3) Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as) to describe relationships between quantities.

(4) Building on and reinforcing their understanding of numbers, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability. Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected.

Students in Grade 6 also build on their work with area in elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and

special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Mathematics Content Emphases

Some clusters of standards were written to require greater emphasis than others. This varied emphasis is based on the depth of the mathematical ideas in the cluster, the time that they take to master, and/or their importance to future mathematics or the demands of college and career readiness. More time in these particular areas is also necessary for students to meet the Standards for Mathematical Practice. Therefore, not all content in a given grade is emphasized equally in the standards.

To say that some things have greater emphasis is not to say that anything in the Standards can be neglected or omitted in instruction. Neglecting material will leave gaps in student skill and understanding and may leave students unprepared for the challenges of a later grade.

Students should spend the majority of their time on the major work of the grade (M). Supporting work (S) and, where appropriate, additional work (A) can engage students in the major work of the grade.

Grade 6 Content Emphases

Major, Supporting, and Additional Clusters

Emphases are given at the cluster level. Refer to the New Jersey Student Learning Standards for Mathematics for the specific standards that fall within each cluster.

Key: **M** — Major, **S** — Supporting Clusters, **A** — Additional Clusters

Grade 6: Major, Supporting, and Additional Clusters

Indicator	Type	Cluster Heading
6.RP.A	M	Understand ratio concepts and use ratio reasoning to solve problems
6.NS.A	M	Apply and extend previous understandings of multiplication and division to multiply and divide fractions
6.NS.B	A	Compute fluently with multi-digit numbers and find common factors and multiples
6.NS.C	M	Apply and extend previous understandings of numbers to the system of rational numbers
6.EE.A	M	Apply and extend previous understandings of arithmetic to algebraic expressions
6.EE.B	M	Reason about and solve one-variable equations and inequalities
6.EE.C	M	Represent and analyze quantitative relationships between dependent and independent variables
6.G.A	S	Solve real-world and mathematical problems involving area, surface area, and volume
6.SP.A	A	Develop understanding of statistical variability
6.SP.B	A	Summarize and describe distributions

Required Fluencies in Grade 6

6.NS.B.2 Divide multi-digit whole numbers using the standard algorithm

6.NS.B.3 Add, subtract, multiply and divide multi-digit decimals using the standard algorithm for each operation