Teaching & Learning Standards

6th GRADE

Cherokee County School District

Mathematics



Year Long Mathematical Practices (MP):

Display perseverance and patience in problem-solving. Demonstrate skills and strategies needed to succeed in mathematics, including critical thinking, reasoning, and effective collaboration, and expression. Seek help and apply feedback. Set and monitor goals.

MP.1 – Make sense of problems and persevere in solving them.

MP.2 – Reason abstractly and quantitatively

MP.3 – Construct viable arguments and critique reasoning of others.

MP.4 – Model with mathematics.

MP.5 – Use appropriate tools strategically.

MP.6 – Attend to precision.

MP.7 – Look for and make use of structure.

MP.8 – Look for and express regularity in repeated reasoning.

Unit 1 - Making Relevant Connections through Number System Fluency (3-4 weeks)

Building on student knowledge and understanding of whole numbers and fractions from elementary school, students will begin working with number relationships to deepen their connection to fractions. Students will continue computation with four operations with both fractions and decimals using a variety of strategies.

Overarching Standards for Unit 1

NR.1: Solve relevant, mathematical problems involving operations with whole numbers, fractions, and decimal numbers.

Standards for Student Mastery for Unit 1

NR.1.1: Add and subtract any combination of fractions fluently to solve problems.

NR.1.2: Multiply and divide any combination of whole numbers, fractions, and mixed numbers using a student-selected strategy. Interpret products and quotients of fractions and solve word problems.

NR.1.3: Perform operations with multi-digit decimal numbers fluently using models and student-selected strategies.

Unit 2 - Rational Exploration (3-4 weeks)

In this unit, the importance of zero is emphasized in this exploration of numbers. Students will be introduced to numbers less than zero and use zero to identify a number and its opposite. The number line will aid students in comparing and ordering fractions, decimals and integers. Students will focus on absolute value as the distance from zero to calculate distance in the coordinate plane.

Overarching Standards for Unit 2

NR.3: Solve a variety of problems involving whole numbers and their opposites; model rational numbers on a number line to describe problems presented in relevant, mathematical situations.

Standards for Student Mastery for Unit 2

NR.3.1: Identify and compare integers and explain the meaning of zero based on multiple authentic situations.

NR.3.2: Order and plot integers on a number line and use distance from zero to discover the connection between integers and their opposites.

NR.3.3: Recognize and explain that opposite signs of integers indicate locations on opposite sides of zero on the number line; recognize and explain that the opposite of the opposite of a number is the number itself.

NR.3.4: Write, interpret, and explain statements of order for rational numbers in authentic, mathematical situations. Compare rational numbers, including integers, using equality and inequality symbols.

NR.3.5: Explain the absolute value of a rational number as its distance from zero on the number line; interpret absolute value as distance for a positive or negative quantity in a relevant situation.

NR.3.6: Distinguish comparisons of absolute value from statements about order.

Unit 3 – Graphing Rational Numbers (2-3 weeks)

Unit 3 extends student understanding of number lines into the four quadrants of the coordinate plane. Students will draw polygons in the coordinate plane by connecting points and calculate side lengths by analyzing the distance between those points. Students will graph when linking tables and points in Quadrant I of the coordinate plane.

Overarching Standards for Unit 3

PAR.8: Graph rational numbers as points on the coordinate plane to represent and solve contextual, mathematical problems; draw polygons using the coordinates for their vertices and find the length of a side of a polygon.

Standards for Student Mastery for Unit 3

PAR.8.1: Locate and position rational numbers on a horizontal or vertical number line; find and position pairs of integers and other rational numbers on a coordinate plane.

PAR.8.2: Show and explain that signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane and determine how two ordered pairs may differ based only on the signs.

PAR.8.3: Solve 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 x-coordinate or the same y-coordinate.

PAR.8.4: 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 x-coordinate or the same y-coordinate.

Unit 4 - Building a Conceptual Understanding of Expressions (2-3 weeks)

In this unit, students begin a more formal study of Algebra as they move from arithmetic experiences to algebraic representations. Students learn to translate verbal phrases and numeric situations into algebraic expressions, understand like terms and work with exponential notation.

Overarching Standards for Unit 4

PAR.6: Identify, write, evaluate, and interpret numerical and algebraic expressions as mathematical models to explain authentic situations.

Standards for Student Mastery for Unit 4

PAR.6.1: Write and evaluate numerical expressions involving rational bases and whole-number exponents.

PAR.6.2: Determine greatest common factors and least common multiples using a variety of strategies to make sense of applicable problems.

PAR.6.3: Write and read expressions that represent operations with numbers and variables in realistic situations.

PAR.6.4: Evaluate expressions when given values for the variables, including expressions that arise in everyday situations.

PAR.6.5: Apply the properties of operations to identify and generate equivalent expressions.

Semester 2 (January – May)

Unit 5 - Exploring Real-life Phenomena through One-Step Equations and Inequalities (4-5 weeks)

In Unit 5, students will explore one-step equations and inequalities. Students will build their problem-solving stamina. Students demonstrate their ability to solve equivalent expressions and possible solutions for inequalities with nonnegative numbers and solutions.

Overarching Standards for Unit 5

PAR.7: Write and solve one-step equations and inequalities as mathematical models to explain authentic, realistic situations.

Standards for Student Mastery for Unit 5

PAR.7.1: Solve one-step equations and inequalities involving variables when values for the variables are given. Determine whether an equation and inequality involving a variable is true or false for a given value of the variable.

PAR.7.2: Write one-step equations and inequalities to represent and solve problems; explain that a variable can represent an unknown number or any number in a specified set.

PAR.7.3: Solve problems by writing and solving equations of the form x ± p = q, px = q, and $\frac{x}{p} = q$ for cases in which p, q and x are all nonnegative rational numbers.

PAR.7.4: Recognize and generate inequalities of the form x > c, x ≥ c, x < c, or x ≤ c to explain situations that have infinitely many solutions; represent solutions of such inequalities on a number line.

Unit 6 - Investigating Rate, Ratio and Proportional Reasoning (3-4 weeks)

In Unit 6, students use computational skills (focusing on fractions) to solve problems in context. Students make connections to the classroom beyond the school day when they explore unit rate, ratios, and calculate percentages using proportional reasoning.

Overarching Standards for Unit 6

NR.4: Solve a variety of contextual problems involving ratios, unit rates, equivalent ratios, percentages, and conversions within measurement systems using proportional reasoning.

Standards for Student Mastery for Unit 6

NR.4.1: Explain the concept of a ratio, represent ratios, and use ratio language to describe a relationship between two quantities.

NR.4.2: 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.

NR.4.3: Solve problems involving proportions using a variety of student-selected strategies.

NR.4.4: Describe the concept of rates and unit rate in the context of a ratio relationship.

NR.4.5: Solve unit rate problems including those involving unit pricing and constant speed.

NR.4.6: Calculate a percent of a quantity as a rate per 100 and solve everyday problems given a percent.

NR.4.7: Use ratios to convert within measurement systems (customary and metric) to solve authentic problems that exist in everyday life.

Unit 7 - Exploring Area and Volume (2-3 weeks)

In In this unit, students extend their work with area and volume from simple figures in elementary school to composite figures, including those with sides of fractional lengths. These figures will be composed and decomposed into triangles and rectangles in order to compute their areas. Nets of solid figures allow students to calculate the surface area of three-dimensional figures.

Overarching Standards for Unit 7

GSR.5: Solve relevant problems involving area, surface area, and volume.

Standards for Student Mastery for Unit 7

GSR.5.1:	Explore area as a measurable attribute of triangles, quadrilaterals, and other polygons conceptually by composing or decomposing into rectangles, triangles, and other shapes. Find the area of these geometric figures to solve problems.
GSR.5.2:	Given the net of three-dimensional figures with rectangular and triangular faces, determine the surface area of these figures.
GSR.5.3:	Calculate the volume of right rectangular prisms with fractional edge lengths by applying the formula, V = (area of base) x (height).

Unit 8 - Exploring Real-life Phenomena through Statistics (4-5 weeks)

In this unit, will be introduced to the study of statistics by experiencing how to design simple experiments and collect data. Students begin with learning what constitutes a statistical question. Students will have the opportunity to collect, analyze and display data through a number of graphical representations. Students will value how statistics affect daily life and the importance of being able to interpret how math represents world events by the end of this unit.

Overarching Standards for Unit 8

NR.2: Apply operations with whole numbers, fractions and decimals within relevant applications.

Standards for Student Mastery for Unit 8

NR.2.1: Describe and interpret the center of the distribution by the equal share value (mean).

NR.2.2: Summarize categorical and quantitative (numerical) data sets in relation to the context: display the distributions of quantitative (numerical) data in plots on a number line, including dot plots, histograms, and box plots and display the distribution of categorical data using bar graphs.

NR.2.3: Interpret numerical data to answer a statistical investigative question created. Describe the distribution of a quantitative (numerical) variable collected, including its center, variability, and overall shape.

NR.2.4: Design simple experiments and collect data. Use data gathered from realistic scenarios and simulations to determine quantitative measures of center (median and/or mean) and variability (interquartile range and range). Use these quantities to draw conclusions about the data, compare different numerical data sets, and make predictions.

NR.2.5: Relate the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

NR.2.6: Describe the impact that inserting or deleting a data point has on the mean and the median of a data set. Create data displays using a dot plot or box plot to examine this impact.

Unit 9 - Culminating Capstone Unit (1-2 weeks)

The capstone unit applies content that has already been learned in previous interdisciplinary PBLs and units throughout the school year. The capstone unit is an interdisciplinary unit that allows students to create a presentation, report, or demonstration that could include their models used to answer an overarching driving question. (e.g., Students can present their solution(s), findings, project, or answer to the driving question to a larger audience during the culminating capstone unit.)

Overarching Standards for Unit 9

NR.1: Solve relevant, mathematical problems involving operations with whole numbers, fractions, and decimal numbers.
NR.2: Apply operations with whole numbers, fractions and decimals within relevant applications.
NR.3: Solve a variety of problems involving whole numbers and their opposites; model rational numbers on a number line to describe problems presented in relevant, mathematical situations.
NR.4: Solve a variety of contextual problems involving ratios, unit rates, equivalent ratios, percentages, and conversions within measurement systems using proportional reasoning.
PAR.6: Identify, write, evaluate, and interpret numerical and algebraic expressions as mathematical models to explain authentic situations.
PAR.7: Write and solve one-step equations and inequalities as mathematical models to explain authentic, realistic situations.
PAR.8: Graph rational numbers as points on the coordinate plane to represent and solve contextual, mathematical problems; draw polygons using the coordinates for their vertices and find the length of a side of a polygon.
GSR.5: Solve relevant problems involving area, surface area, and volume.

Standards for Student Mastery for Unit 9

ALL associated learning objectives.