

ROBERT C. PARKER SCHOOL
K - 8 MATH CURRICULUM

Gaining a deep understanding of mathematics is important to becoming a life-long learner. The foundation, or basic rules and operations, must be understood in order to progress successfully through mathematics. Once the foundation is in place students are able to build upon that foundation by learning higher levels of mathematics.

We offer students multiple representations of mathematical processes and solutions; our curriculum benefits all types of learners and gives every student success. Our mathematics curriculum is based upon investigations. Our students also complete research, facilitated by the teachers, to develop the rules, concepts, and vocabulary of mathematics.

Parker students maintain math journals at every level. In the early grades the journals are primarily reflective – the students write (or draw) about how they solved problems and what they learned during the week. In the upper grades journals are used to develop critical thinking, problem-solving, and metacognitive skills.

In Kindergarten, the focus in mathematics is on the process of working through problems. In the upper grades, students continue to apply their knowledge to new problems. Learning is completed through investigations of concepts. Each student is challenged to excel. Students who have gained a solid understanding of the math concepts are given opportunities to deepen their understanding and those who struggle are provided additional assistance as needed.

Math is taught in grade-level groups.

Texts:

K – 4 Investigations in Number, Data, and Space

5 – 7 Connected Math

8 NY State Regents Integrated Algebra

Kindergarten

Unit 1: Who Is In school today?

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Data Analysis** Sorting and Classifying
- **Data Analysis** Carrying out a data investigation
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 2: Counting and Comparing (Measurement and the Number System)

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Counting and Quantity** Developing the idea of equivalence
- **Linear Measurement** Understanding length
- **Counting and Quantity** Developing an understanding of the magnitude and position of numbers
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 3: What Comes Next? (Patterns and Functions)

- **Data Analysis** Sorting and classifying
- **Repeating Patterns** Constructing, describing, and extending repeating patterns
- **Repeating Patterns** Identifying the unit of a repeating pattern

Unit 4: Measuring and Counting (Measurement and the Number System)

- **Linear Measurement** Understanding length and using linear units
- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Whole-Number Operations.** Making sense of and developing strategies to solve addition and subtraction problems with small numbers
- **Counting and Quantity** Developing an understanding of the magnitude and position of numbers
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 5: Make a Shape, Build a Block (2-D and 3-D Geometry)

- **Features of Shapes** Describing, identifying, comparing, and sorting 2-D and 3-D shapes
- **Features of Shapes** Composing and decomposing 2-D and 3-D shapes

Unit 6: How Many Do You Have? (Addition, Subtraction, and the Number System)

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Whole-Number Operations** Making sense of and developing strategies to solve addition and subtraction problems with small numbers
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 7: Sorting and Surveys (Data Analysis)

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Data Analysis** Representing data
- **Data Analysis** Sorting and classifying
- **Data Analysis** Carrying out a data investigation

First Grade

Unit 1: How Many Of Each? (Addition, Subtraction, and the Number System)

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Counting and Quantity** Developing an understanding of the magnitude and position of numbers
- **Number Composition** Composing numbers up to 10 with 2 addends
- **Whole-Number Operations** Making sense of and developing strategies to solve addition problems with small numbers
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 2: Making Shapes and Designing Quilts (2-D Geometry)

- **Features of Shape** Describing, identifying, and comparing 2-D shapes
- **Features of Shape** Composing and decomposing 2-D shapes

Unit 3: Solving Story Problems (Addition, Subtraction, and the Number System)

- **Number Combinations** Composing numbers up to 15 with two or more addends
- **Whole-Number Operations** Making sense of and developing strategies to solve addition and subtraction problems with small numbers
- **Number Composition** Representing numbers by using equivalent expressions
- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones
- **Whole-Number Computation** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 4: What Would You Rather Be? (Data Analysis)

- **Data Analysis** Sorting and classifying
- **Data Analysis** Representing data
- **Data Analysis** Describing data
- **Data Analysis** Designing and carrying out a data investigation

Unit 5: Fish Lengths and Animal Jumps (Measurement)

- **Linear Measurement** Understanding length
- **Linear Measurement** Using linear units
- **Linear Measurement** Measuring with standard units

Unit 6: Number Games and Crayon Puzzles (Addition, Subtraction, and the Number System)

- **Number Composition** Composing numbers up to 20 with 2 or more addends
- **Whole-Number Operations** Making sense of and developing strategies to solve addition and subtraction problems with small numbers
- **Representing Mathematical Thinking** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 7: Color, Shape, and Number Patterns (Patterns and Functions)

- **Repeating Patterns** Constructing, describing, and extending repeating patterns
- **Repeating Patterns** Identifying the unit of a repeating pattern
- **Number Sequences** Constructing, describing, and extending number sequences with constant increments generated by various contexts

Unit 8: Twos, Fives, and Tens (Addition, Subtraction, and the Number System)

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones and by groups
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions
- **Computational Fluency** Knowing addition combinations of 10

Unit 9: Blocks and Books (3-D Geometry)

- **Features of Shape** Describing and comparing 2-D and 3-D shapes
- **Features of Shape** Exploring the relationships between 2-D and 3-D shapes

Second Grade

Unit 1: Counting, Coins, and Combinations (Addition, Subtraction, and the Number System)

- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones and groups
- **Counting and Quantity** Developing an understanding of the magnitude and sequence of numbers up to 100
- **Whole-Number Operations** Making sense of and developing strategies to solve addition and subtraction problems with totals up to 45
- **Computational Fluency** Knowing addition combinations to $10 + 10$
- **Whole-Number Operations** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 2: Shapes, Blocks, and Symmetry (2-D and 3-D Geometry)

- **Features of Shape** Composing and decomposing 2-D and 3-D shapes
- **Features of Shape** Describing, identifying, comparing, and sorting 2-D and 3-D shapes
- **Area Measurement** Visualizing the structure of arrays
- **Features of Shape** Exploring mirror symmetry
- **Computational Fluency** Knowing addition combinations to $10 + 10$

Unit 3: Stickers, Number Strings, and Story Problems (Addition, Subtraction, and the Number System)

- **Whole-Number Operations** Making sense of and developing strategies to solve addition and subtraction problems with totals up to 45
- **Whole-Number Operations** Understanding the properties of addition and subtraction
- **Counting and Quantity** Counting by equal groups
- **Counting and Quantity** Developing strategies for accurately counting a set of objects by ones and groups
- **The Base-Ten Number System** Understanding the equivalence of one group and the discrete units that comprise it
- **Whole-Number Computation** Using manipulatives, drawings, tools, and notation to show strategies and solutions
- **Computational Fluency** Knowing addition combinations to $10 + 10$

Unit 4: Pockets, Teeth, and Favorite Things (Data Analysis)

- **Data Analysis** Sorting and classifying data
- **Data Analysis** Representing data
- **Data Analysis** Describing data
- **Data Analysis** Designing and carrying out a data investigation

Unit 5: How Many Floors? How Many Rooms? (Patterns, Functions, and Change)

- **Linear Relationships** Describing and representing ratios
- **Using Tables and Graphs** Using tables to represent change
- **Number Sequences** Constructing, describing, and extending number sequences with constant increments generated by various contexts

Unit 6: How Many Tens? How Many Ones? (Addition, Subtraction, and the Number System)

- **Whole-Number Operation** Making sense of and developing strategies to solve addition and subtraction problems with totals up to 100
- **Counting and Quantity** Developing an understanding of the magnitude and sequence of numbers up to 100
- **Counting and Quantity** Counting by equal groups
- **The Base-Ten Number System** Understanding the equivalence of one group and the discrete units that comprise it
- **Whole-Number Computation** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 7: Parts of a Whole, Parts of a Group (Fractions)

- **Rational Numbers** Understanding fractions as equal parts of a whole
- **Rational Numbers** Understanding fractions as equal parts of a group
- **Rational Numbers** Using terms and notation

Unit 8: Partners, Teams, and Paper Clips (Addition, Subtraction, and the Number System)

- **Whole-Number Operations** Adding even and odd numbers
- **Computational Fluency** Knowing addition combinations to $10 + 10$
- **Whole-Number Operations** Making sense of and developing strategies to solve addition and subtraction problems with totals to 100
- **Whole-Number Computation** Using manipulatives, drawings, tools, and notation to show strategies and solutions

Unit 9: Measuring Length and Time (Measurement)

- **Linear Measurement** Understanding length
- **Linear Measurement** Using linear units
- **Linear Measurement** Measuring with standard units
- **Time** Representing time and calculating duration

Third Grade

Unit 1: Trading Stickers, Combining Coins (Addition, Subtraction, and the Number System)

- **The Base-Ten Number System** Understanding the equivalence of one group and the units that comprise it
- **Computational Fluency** Adding and subtracting accurately and efficiently

Unit 2: Surveys and Line Plots (Data Analysis)

- **Data Analysis** Describing, summarizing, and comparing data
- **Data Analysis** Representing data
- **Data Analysis** Designing and carrying out a data investigation
- **Linear Measurement** Measuring with standard units

Unit 3: Collections and Travel Stories (Addition, Subtraction, and the Number System)

- **The Base-Ten Number System** Extending knowledge of the number system to 1,000
- **The Base-Ten Number System** Understanding the equivalence of one group and the discrete units that comprise it
- **Computational Fluency** Adding and subtracting accurately and efficiently
- **Whole-Number Operations** Understanding different types of subtraction problems

Unit 4: Perimeter, Angles, and Area (2-D Geometry and Measurement)

- **Linear Measurement** Measuring with standard units
- **Linear Measurement** Understanding and finding perimeter
- **Area Measurement** Understanding and finding area
- **Features of Shape** Describing and classifying 2-dimensional figures
- **Features of Shape** Describing and measuring angles

Unit 5: Equal Groups (Multiplication and Division)

- **Whole-Number Operations** Understanding the meaning of multiplication
- **Whole-Number Operations** Reasoning about numbers and their factors and multiples
- **Whole-Number Operations** Understanding and working with an array model of multiplication
- **Computational Fluency** Learning the multiplication combinations with products up to 50 fluently
- **Whole-Number Operations** Developing strategies for division based on understanding the inverse relationship between multiplication and division

Unit 6: Stories, Tables, and Graphs (Patterns, Functions, and Change)

- **Using Tables and Graphs** Using graphs to represent change
- **Using Tables and Graphs** Using tables to represent change
- **Linear Change** Describing and representing a constant rate of change
- **Number Sequences** Constructing, describing, and extending number sequences with constant increments generated by various contexts
- **Measuring Temperature** Understanding temperature and measuring with standard units

Unit 7: Finding Fair Shares (Fractions and Decimals)

- **Rational Numbers** Understanding the meaning of fractions (halves, fourths, eighths, thirds, sixths) and decimal fractions (0.50, 0.25) as equal parts of a whole (an object, an area, a set of objects)
- **Rational Numbers** Using representations to combine fractions (halves, fourths, eighths, thirds, and sixths)

Unit 8: How Many Hundreds? How Many Miles? (Addition, Subtraction, and the Number System)

- **Computational Fluency** Adding and subtracting accurately and efficiently
- **Whole-Number Operations** Describing, analyzing, and comparing strategies for adding and subtracting whole numbers

Unit 9: Solids and Boxes (3-D Geometry and Measurement)

- **Features of Shape** Describing properties of 3-dimensional shapes
- **Features of Shape** Translating between 2-dimensional and 3-dimensional shapes
- **Volume** Structuring rectangular prisms and determining their volume

Fourth Grade

Unit 1: Factors, Multiples, and Arrays (Multiplication and Division)

- **Whole-Number Operations** Understanding and working with an array model of multiplication
- **Whole-Number Operations** Reasoning about numbers and their factors
- **Computational Fluency** Fluency with multiplication combinations to 12×12

Unit 2: Describing the Shape of the Data (Data Analysis and Probability)

- **Data Analysis** Representing data
- **Data Analysis** Describing, summarizing, and comparing data
- **Data Analysis** Analyzing and interpreting data
- **Data Analysis** Designing and carrying out a data investigation
- **Probability** Describing the probability of an event

Unit 3: Multiple Towers and Division Stories (Multiplication and Division)

- **Computational Fluency** Solving multiplication problems with 2-digit numbers
- **Whole-Number Operations** Understanding and using the relationship between multiplication and division to solve division problems
- **Whole-Number Operations** Reasoning about numbers and their factors
- **Whole-Number Operations** Representing the meaning of multiplication and division

Unit 4: Size, Shape, and Symmetry (2-D Geometry and Measurement)

- **Linear Measurement** Measuring with standard units
- **Features of Shape** Describing and classifying 2-dimensional figures
- **Features of Shape** Describing and measuring angles
- **Area Measurement** Finding and understanding area

Unit 5: Landmarks and Large Numbers (Addition, Subtraction, and the Number System)

- **The Base-Ten Number System** Extending knowledge of the number system to 10,000
- **Computational Fluency** Adding and subtracting accurately and efficiently
- **Whole-Number Operations** Describing, analyzing, and comparing strategies for adding and subtracting whole numbers
- **Whole-Number Operations** Understanding different types of subtraction problems

Unit 6: Fraction Cards and Decimal Squares (Fractions and Decimals)

- **Rational Numbers** Understanding the meaning of fractions and decimal fractions
- **Rational Numbers** Comparing the values of fractions and decimal fractions
- **Computation with Rational Numbers** Using representations to add rational numbers

Unit 7: Moving Between Solids and Silhouettes (3-D Geometry and Measurement)

- **Features of Shape** Describing properties of 3-dimensional shapes
- **Features of Shape** Translating between 2-dimensional and 3-dimensional shapes
- **Volume** Structuring rectangular prisms and determining their volume

Unit 8: How Many Packages? How Many Groups? (Multiplication and Division)

- **Computational Fluency** Solving multiplication problems with 2-digit numbers
- **Whole-Number Operations** Understanding division as making groups of the divisor

Unit 9: Penny Jars and Plant Growth (Patterns, Functions, and Change)

- **Using Tables and Graphs** Using graphs to represent change
- **Using Tables and Graphs** Using tables to represent change
- **Linear Change** Describing and representing a constant rate of change

Fifth Grade

Unit 1: Prime Time (Factors and Multiples)

- **Number theory:** factors, multiples, primes, composites, prime factorization

Unit 2: Data About Us (Statistics)

- formulate questions
- gather, organize, represent, and analyze data
- interpret results from data
- measures of center and range

Unit 3: Shapes and Designs (Two-Dimensional Geometry)

- regular and non-regular polygons
- special properties of triangles and quadrilaterals
- angle measure and angle sums
- tiling

Unit 4: Bits and Pieces II (Understanding Fraction Operations)

- understanding and skill with addition, subtraction, multiplication,
- division of fractions

Sixth Grade

Unit 1: Covering and Surrounding (Two-Dimensional Measurement)

- area and perimeter relationships
- area and perimeter of polygons and circles
- formulas to find area and perimeter

Unit 2: Bits and Pieces III (Computing With Decimals and Percents)

- understanding and skill with addition, subtraction, multiplication, and division of decimals
- solving percent problems
- conversion to/from decimals

Unit 3: Stretching and Shrinking (Similarity)

- similar figures
- scale factors
- side length ratios
- basic similarity
- transformations and their algebraic rules

Unit 4: Comparing and Scaling (Ratio, Proportion, and Percent)

- rates and ratios
- making comparisons
- proportional reasoning
- solving proportions

Seventh Grade

Unit 1: Accentuate the Negative (Positive and Negative Numbers)

- understanding and modeling positive and negative integers
- understanding and modeling rational numbers
- order of operations
- distributive property
- four-quadrant graphing

Unit 2: Variables and Patterns (Introducing Algebra)

- variables
- representations of relationships
- tables, graphs, words, and symbols

Unit 3: Moving Straight Ahead (Linear Relationships)

- recognize and represent linear relationships in tables, graphs, words, and symbols
- solve linear equations
- introduction to slope

Unit 4: Looking for Pythagoras (The Pythagorean Theorem)

- square roots
- the Pythagorean Theorem
- connections among coordinates, slope, distance, and area
- distances in the plane

Eighth Grade

Unit 1: Language of Algebra

- algebraic vocabulary
- mathematical properties
- Percent change

Unit 2: Linear Equations

- review of coordinate plane
- introduction to solving linear equations
- introduction to functions

Unit 3: Slope

- introduction to slope
- slope-intercept form
- point-slope form
- parallel and perpendicular lines
- correlations

Unit 4: Linear Inequalities

- introduction to solving inequalities
- solving compound inequalities
- solving absolute value problems

Unit 5: Linear Systems

- introduction to linear systems
- solving linear systems with substitution
- solving linear systems graphically
- solving word problems

Unit 6: Polynomials

- addition and subtraction of polynomials
- multiplication and subtraction of polynomials
- scientific notation

Unit 7: Factoring Polynomials

- factoring polynomials
- factoring trinomials
- factoring special cases (difference of squares, perfect squares)

Unit 8: Radical Expressions

- adding, subtracting, multiplying, and dividing radical expressions
- simplifying radical expressions
- solving equations involving radical terms
- Pythagorean Theorem
- trigonometric ratios

Unit 9: Quadratic Equations

- graphing quadratic equations – axis of symmetry, vertex, maxima
- exponential functions
- exponential growth and decay

Unit 10: Statistics and Probability

- histograms, box-and-whisker plots
- measures of central tendency, measures of variation
- sampling and bias
- counting outcomes – tree diagrams, Counting Principle
- permutations, combinations