

FAIRVIEW SCHOOL DISTRICT 72 MATH SCOPE/SEQUENCE

STATE GOAL 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, and division), patterns, ratios and proportions.

Kindergarten

- 1 to 1 correspondence
- Counting numbers orally 1-100
- Counting objects 1-20
- Counting backwards 20-0
- Comparing and estimating objects in groups
- Writing numbers 1-20
- Recognizing and extending AB patterns
- Skip counting by 2's to 20, 5's and 10's to 100
- Calendar
- Beginning place value (ones, tens, and hundreds)

First

- Count, recognize, write, order, and compare numbers
- Describe numbers using number pairs
- Understand number relationships (more than, less than, and equal to)
- Solve + - problems
- Model place value with 2 digit numbers
- Introduce half and whole recognize equal parts.
- Recognize and extend patterns

Second

- Greater than/ Less than
- Fractions: $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, parts of whole
- One to two step problems (computation and/or word problem) using addition & subtraction
- Patterns (a-b and number patterns)
- Skip counting
- Justify solutions with an oral explanation
- Multiplication using groupings (i.e., repeated addition)
- Rounding numbers using a number line
- Place value through hundreds
- Even/Odd Numbers

Third

- Greater than, Less than, and Equal to
- Even/Odd Numbers
- Addition, subtraction, and multiplication
- Solve one and two step word problems using addition/ subtraction/multiplication
- Explain how and why to solve a problem
- Introduce division through fact families
- Introduce regrouping
- Missing addends
- Estimation/Rounding
- Place value to 100,000

Fourth

- Place value to 1,000,000
- Number relationships
- Order and compare whole numbers
- Addition and subtraction with whole numbers
- Solve problems with addition, subtraction, multiplication, and division
- Equivalent fractions
- Locating whole numbers and fractions on a number line
- Ordering and comparing fractions
- Ordering and comparing decimals
- Quick recall of multiplication and division facts
- Using one and two digit multipliers (i.e., 3×34 ; 3×345 ; 34×45)
- Adding and subtracting fractions with like denominators
- Estimation
- Money and making change
- Rounding numbers

Fifth

- Fractions: Equivalences, comparisons, ordering, adding, subtracting, multiplying with and without common denominators, mixed, improper, and lowest terms
- Decimals: Adding, subtracting, multiplying, and dividing with whole number divisors
- Problem solving: Multi-step, using a calculator when appropriate.

Sixth

Includes topics from fifth grade as well as:

- Dividing fractions
- Dividing with a decimal divisor
- Ratios and proportions
- Writing and solving proportions

- Introduce: Variables, factors, multiples, primes and composites, GCF, and LCM
- Introduce: Negative numbers, prime factorization, and order of operations

Seventh

- Exponents: Positive and negative
- Routine and non-routine problem solving
- Order of operations: Whole numbers, integers, fractions and decimals with and without nested groups
- Integers: Order, opposites, absolute value, and number line placement
- Number theory: Factors, multiples, GCF, LCM, prime factorization, primes, and composites
- Fractions: compare and order, mixed to/from improper
- Decimals: Place value, compare, order, terminating or repeating forms, and round off
- Scientific notation
- Working with powers of ten
- Properties: Distributive, commutative, associative, and identities (zero and one)
- Reciprocals
- Ratio, proportion, percent, and unit rate
- Percentage, rate, and base equations
- Interest
- Calculating a discount
- Square root
- Percent of change
- Percent greater than 100% and less than 1%

Eighth

- Using rates
- Proportional reasoning
- Percent equations
- Estimating percent
- Percent of change
- Computation with integers, rational numbers
- Square Root: Rational (perfect squares) and irrationals
- Scientific Notation
- Routine and non-routine problem solving
- Extension: Fractal patterns

STATE GOAL 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Kindergarten

- Measuring length with non-standard units (i.e., linker cubes)
- Measuring weight (sink or float)
- Calendar
- Introduce coins
- Patterns
- Skip counting

First

- Non-standard units to compare and order objects
- Tell time by the hour and $\frac{1}{2}$ hour
- Identify coins and find their values
- Count up to one dollar using pennies, nickels, dimes, and quarters.
- Count coins up to \$.30 cents
- Calendar
- Estimate and determine appropriate amount

Second

- Measure length: Inches, cm., feet, and yard
- Calendar: Month, day's in a month, how many weeks in a month
- Tell time by the hour and $\frac{1}{2}$ hour
- Money: Recognize all coins and make change up to \$1.00
- Temperature: Read a thermometer (Fahrenheit)

Third

- Length: Customary and metric
- Width: Customary and metric
- Weight: Customary and metric
- Capacity
- Time/ Elapsed time
- Money: Currency name, value, making change, and adding dollars
- Calendar
- Temperature- Fahrenheit and Celsius
- Perimeter
- Area
- Volume

Fourth

- Length: Customary and metric
- Width: Customary and metric
- Weight: Customary and metric
- Perimeter and area of rectangles, squares
- Capacity: Customary and metric units and converting within system
- Estimation of measures
- Temperature: Fahrenheit and Celsius
- Telling time and elapsed time

Fifth

- Conversions within systems both customary (multiply and divide) and metric (powers of ten)
- Selecting proper units for estimation of length and mass
- Liquid measure: Customary units of capacity
- Area, perimeter, and volume
- Build/ sketch figures with a given area, perimeter, or volume.

Sixth

- Conversion of units, both metric and customary
- Adding and subtracting customary units with/without regrouping
- Problem solving with area, perimeter, and volume
- Introduce volume of a cylinder
- Area of a circle (π) and circumference.

Seventh

- Volume: Cubes and prisms
- Perimeter with whole numbers, fractions, decimals and variable expressions
- Metric system, kilo- hecto- deka- m- L- g- deci- centi- milli-
- Circumference
- Areas of polygons: Parallelograms, triangles, and trapezoids
- Surface area of simple rectangular and triangular prisms
- Area of circles
- Scale drawings
- Similarity
- Volume: Prisms and cylinders
- Customary measure

Eighth

- Circumference
- Volume: Prisms, cylinders, pyramids, and cones
- Perimeter and area: Plane figures
- Surface area: Prisms, pyramids, and cylinders

STATE GOAL 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

Kindergarten

- Identifying, creating, and extending patterns

First

- Identify, describe, and extend simple geometric and numeric patterns
- Solve simple number sentences with missing addends
- Describe basic arithmetic operations orally, in writing, and using concrete materials
- Find the unknown numbers in whole number addition

Second

- Patterns: Identify and complete patterns
- Solve number sentences
- Write addition and subtraction
- Story problems with addition and subtraction
- Fact families

Third

- Ordered pairs (coordinate Grids)
- Number patterns: Name/complete
- Number sentences: Solve/write/explain
- Sorting/Grouping/Classification

Fourth

- Describe and extend a pattern or sequence
- Find the missing term in a pattern or sequence
- Find the missing value in equations (i.e., $y = 5(x) - 2$)
- Evaluate expressions (i.e., $z - 6$ if $z = 12$)
- Write equations and expressions & inequalities (i.e., $6 \times 3 = 18$, $14 + 6 > 18$, 7×3)
- Solve problems with unknowns

Fifth

- Identify, describe, and extend patterns
- Solve number sentences using a “box” as the missing number (variable)
- Graphing/ plotting points on a grid using positive numbers

Sixth

- Use formal methods of extending patterns (rule, general rule, and term table)
- Use variables in expressions and equations
- Write and use equations to solve problems
- Graph ordered pairs on a coordinate grid

Seventh

- Table equation graph models
- Linear and non-linear patterns
- Variable expressions: Order of operations
- Coordinate graphing in four quadrants
- Graph two lines on same coordinate plane
- Solve one and two step equations with whole numbers, fractions, and decimals
- Graph and solve one or two step inequalities

Eighth

- Solve one and two step equations with rational numbers
- Write equations from a rule
- Simplify Expressions: Arithmetic and algebraic (i.e., combine like terms)
- Graph inequalities
- Graph equations in the coordinate plane
- Slope
- Slope intercept form of a line
- Rules of exponents
- Solve and graph one and two step inequalities
- Exponential functions
- Graph Quadratic Equations: Parabola

STATE GOAL 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

Kindergarten

- Use story problems orally and with manipulatives
- Place value (ones, tens, and hundreds) using calendar
- Geometry: Basic two- dimensional shapes (i.e., circle, square, triangle, and rectangle)
- Introduce three dimensional shapes

First

- Identify related two dimensional shapes
- Draw two dimensional shapes
- Compare and contrast geometric shapes
- Sort, classify, and compare similar shapes

Second

- Introduce concepts of geometry using standard vocabulary
- Introduce vertex, edge, sides, faces, congruent, and parallel lines
- Create shapes: Triangle, rectangle, square, rhombus, trapezoid, hexagon, and parallelogram
- Describe characteristics of shapes
- Sort, classify, and compare familiar shapes

Third

- Two dimensional shapes: Naming/labeling parts(i.e., side, vertex, and vertices)
- Define: Polygon, line/, line segment, ray, angle, and right angle
- Flips/Slides
- Three dimensional shapes: Name/label/count edges, faces, corners
- Perimeter
- Area
- Volume
- Symmetry/Line of symmetry
- Congruence
- Tangrams

Fourth

- Identify angles: Right, acute, and obtuse
- Identify parallel and perpendicular lines
- Identify polygons
- Transformations: Translations, reflections, and rotations
- Identify symmetry lines
- Identify congruent and similar figures
- Graphing ordered pairs
- Identify three dimensional shapes

- Identify faces, edges, and vertices on three-dimensional shapes

Fifth

- Properties of polygons and angles
- Measuring angles (with protractor)
- Properties of triangles: Types, sides, and angle rule.

Sixth

- Build on previous knowledge of polygons
- Circles (parts of, circumference, and pi)
- Use of a compass
- Build on knowledge of transformations (i.e., rotation, reflection, and translation)
- Congruence and similarity (using ratios to check for similarity)

Seventh

- Basic geometric tools: Ray, angle, vertex, degree, right angle, straight angle, acute, obtuse, reflex angles
- Special angles: Complements, supplements, angles formed by parallel lines and a transversal
- Parallel and perpendicular
- Construct triangles: Isosceles, Scalene, and Equilateral
- Circles: Center, radius, chord, diameter, and arc
- Transformations: rotations, reflections, and translations
- Congruency
- Extension: Drawing software: geometer sketchpad

Eighth

- Similar figures
- Bisect chords
- Rotational symmetry
- Line symmetry
- Quadrilaterals
- Angles of polygons: patterns and formula
- Triangles: Pythagorean Theorem
- Complements and Supplements
- Tangent Ratio
- Parallel lines and transversals

STATE GOAL 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Kindergarten

- Graphing
- Student conducted surveys
- 100's day collections

First

- Organize and display data using pictures, tallies, tables, charts or bar graphs
- Answer questions and make predictions based on given data
- Analyze data, draw conclusions, and communicate the results

Second

- Data collection
- How many numbers are in your name?
- Graph reading data
- Take surveys and place information on a simple graph
- Use rainbow tiles to make patterns
- Identify number patterns on a 100 chart
- Linker cubes train patterns
- Probability

Third

- Creating/ reading/ answering questions from various types of graphs/tables/charts
- Data collection/conduct a survey
- Probability: Define/list possible outcomes/record

Fourth

- Read and interpret tables and graphs
- Create tables and graphs
- Determine range, mode, and mean
- Describe probability events with ratios or fractions

Fifth

- Build on previous knowledge of graphs: Interpret/create (bar, line, and circle)

Sixth

- Build on previous knowledge of construction/interpretation of graphs (bar, line, and circle)
- Choose the appropriate type of graph based on the data
- Use software/web sites to create graphs
- Stem-and-leaf plots and scatter plots (line of best fit)

- Averages (measures of central tendency)
- Different types of probability

Seventh

- Interpret and create graphs both with and without technology (i.e., graphing calculators and Excel)
- Experimental and theoretical probability- single and multi-stage
- Independent and dependent probability
- Stem and leaf plots
- Box and whisker plots (interpret only)
- Histograms
- Tree diagrams
- Geometric probability
- Circle graphs
- Statistical measures: mean, median, mode, and range

Eighth

- Construct: Stem and leaf plots, Box and whisker plots, scatter plots
- Theoretical probability: Single stage and multi-stage, independent and dependent events, geometrical probability
- Tree diagrams
- Combinations and permutations
- The counting principle