

Year Long Mathematics Plan

Fourth Grade

First Quarter:

Discovering Patterns and Relationships (~5 weeks)

***Concepts covered:** patterns, relationships, T-tables, and graphs.

***Critical Content:** comparing, calculate whole numbers, integers, communication, data analysis, patterns, graphs, tables and pictures.

***Standards Covered:**

Describe, extend and make generalizations about patterns and sequences and supply missing elements in chart or table format

Supply a missing element in or determine a rule that extends number patterns involving addition or subtraction of decimals

Select operational and relational symbols to make a number sentence true (e.g., $4 \times 3 = 12$, $5 + 17 = 22$)

Represent and solve open sentences or problems involving numeric equations or inequalities (e.g., $3 + ? = 4$; $2 + 1 > ?$, $4 < 2 + ?$)

Translate between different representations (words, numeric, pictorial) of a simple quantitative relationship (e.g., match a table of values to its rule)

Collecting and Analyzing Data (~4 weeks)

***Concepts Covered:** collecting and analyzing data, determining probability, stem and leaf plots, mean, median, mode, and range,

***Critical Content:** comparing, calculating whole numbers, decimals, integers, units of measurement, communication, models, graphs, tables, variables, geometric figures, strategies, pictures.

***Standards Covered:**

Determine the median for a set of data and understand what each statistic does and does not indicate about the data

Determine probability of a single event

Understand that the probability of an event can be represented by a number from 0 to 1

Conduct experiments and simulations to determine experimental probability of different outcomes

Represent and interpret data collected from probability experiments and simulations using tallies, charts, pictograms, and bar graphs, including determining probabilities of single events

Predict the degree of likelihood of a single event occurring using words such as certain, impossible, most often, least often, likely, and unlikely

Predict the likelihood of an outcome prior to an experiment and compare predicted probability with the actual results.

Second Quarter:

Reasoning with Operations (~5 weeks)

***Concepts covered:** addition, subtraction, multiplication, division, estimation and order of operations.

***Critical Content:** computational estimation, reasonableness of estimation, factors, primes, multiples, comparing number systems, calculating whole numbers, integers, communication, measurement, data analysis, patterns, graphs, tables, and strategies.

***Standards Covered:**

Determine factors of whole numbers to 100 using models such as arrays.

Identify the most efficient operation (add, subtract, multiply, or divide) for solving a problem

Mentally multiply or divide multiples of 10

Add and subtract decimals to hundredths, including money amounts

Determine the meaning of whole number remainders

Multiply a three digit number by a one digit number

Apply efficient strategies for determining multiplication and division facts 0-9

Develop and evaluate strategies for multiplying and dividing whole numbers and adding and subtracting fractions with like denominators

Determine factors of whole numbers to 100 using models such as arrays.

Select and use an appropriate estimation strategy (overestimate, underestimate, range of estimates) based on the problem situation when computing with whole numbers or money amounts

Use place value concepts such as rounding to nearest 10, 100 and 1000 to estimate and check reasonableness of answers.

Use inverse operations (addition and subtraction, multiplications and division) to solve problems and check solutions involving calculations with whole numbers

Apply the commutative, associative and identity properties of addition and multiplication and the distributive property to simplify calculations with whole numbers

Exploring Fractional Parts (~4 weeks)

***Concepts Covered:** fractional parts

***Critical Content:** number systems, decimals, communication, measurement, data analysis, graphs and tables, variables, models, pictures, ordering and comparing.

***Standards Covered:**

Add and subtract commonly used fractions with like denominators (halves, thirds, fourths, eighths, tenths) and decimals to hundredth

Demonstrate the meaning of fractions as part of a unit whole or as parts of a collection or set.

Third Quarter:

Representing Rational Numbers: (~5 weeks)

***Concepts covered:** number sense, place value ones to millions, decimals and rational number sense

***Critical Content:** patterns, graphing, place value, comparing, estimating, and ordering, primes, factors, multiples, fractions, decimals, percent, communication, units of measurement, direct measurement, data analysis, variables and strategies.

***Standards Covered:**

Read, write, order, model, and compare whole numbers to one million, common fractions, and decimals to hundredths

Identify the place value and actual value of digits in a number to one million

Model, recognize, and generate equivalent forms of decimals to hundredths

Locate common fractions and decimals on a number line

Shapes and their Properties (~3 weeks)

***Concepts Covered:** Two and three-dimensional shapes

***Critical Content:** properties of triangles and quadrilaterals, angle measurement, line plot, rays, perpendicular, parallel lines,

***Standards Covered:**

Determine perimeter and area of rectangles given lengths of sides

Determine defining properties that characterize classes of quadrilaterals including side and angle measurements and their component parts (e.g., altitudes, medians, diagonals, bisectors)

Identify right, acute, and obtuse angles in isolation and in geometric figures

Use properties of quadrilaterals to determine the lengths of their sides and perimeters

Develop, understand, and apply the property of the sum of the angle measures in a quadrilateral is 360 degrees

Identify congruent quadrilaterals using concrete methods.

Draw conclusions about the measures of corresponding sides and angles of two congruent quadrilaterals.

Model, sketch, draw, and label points, lines, line segments, angles, rays, quadrilaterals, and parallel, perpendicular, and intersecting lines.

Build three-dimensional objects and sketch two-dimensional representations of the object.

Locate coordinates of points on graph paper, maps, globes and other charts

Determine the shortest path of horizontal and vertical movement between two locations grid

Identify and describe a motion or series of motions that will show two quadrilaterals are congruent

Fourth Quarter:

Building and Filling Boxes (~4 weeks)

***Concepts Covered:** two and three-dimensional surfaces, relationships between volume and dimensions, surface area, and estimation.

***Critical Content:** tools of measurement, estimation, communication, data analysis, properties and relationships.

***Standards Covered:**

Develop, understand, and apply the property of the sum of the angle measures in a quadrilateral is 360 degrees

Identify congruent quadrilaterals using concrete methods.

Draw conclusions about the measures of corresponding sides and angles of two congruent quadrilaterals.

Model, sketch, draw, and label points, lines, line segments, angles, rays, quadrilaterals, and parallel, perpendicular, and intersecting lines.

Build three-dimensional objects and sketch two-dimensional representations of the object.

Measurement (~4 weeks)

***Standards Covered:**

Select the most appropriate tool and US customary unit to measure length, perimeter, weight, and volume

Carry out simple unit conversions within the US customary system

Determine elapsed time requiring unit conversions

Read temperature measurements of thermometers with Fahrenheit and Celsius units and recognize reasonable ranges of temperatures for different events.

Determine measurements of length and perimeter to the nearest inch and nearest foot

Estimate the length of objects in inches, feet and yards.

Determine measurements of volume to the nearest 1/4 cup, quart, or gallon of measuring cups, beakers, or graduated cylinders

Estimate the volume of objects in cups, quarts, and gallons.

Determine measurements of weight to the nearest ounce and pound

Estimate the weight of objects in ounces and pounds

Relate the area of a rectangle and its dimensions to area models for multiplication and division.

Estimate and measure the area of a rectangular surface using unit squares.

Use referents for US customary measurements to make estimates of length, weight, and volume and evaluate the reasonableness of the estimate.

Exploring Tessellations (~2 weeks)

***Concepts covered:** tessellations, polygons, triangles, and quadrilaterals.

***Critical Content:** integers, communication, units of measurement, models, variables, geometric figures, properties of geometric figures, strategies, and pictures.

***Standards Covered:**

Predict and describe the results of performing reflections, rotations and translations of quadrilaterals

Problem Solving: (Ongoing throughout the year.)

Along with teaching problem solving strategies, students will be taught the State Mathematics Scoring Guide to be used as an assessment tool.

***Concepts covered:** Word problems with multiple steps, Scoring Guide

***Critical Content:** Problem solving strategies

***Standards Covered:**

Interpret the concepts of a problem-solving task and translate them into mathematics

Choose strategies that can work and then carry out the strategies chosen

Produce identifiable evidence of a second look at the concepts/strategies/calculations to defend a solution

Use pictures, symbols, and/or vocabulary to convey the path to the identified solution

Accurately solve problems using mathematics