

## **K-5 Curriculum Highlights -Mathematics**

### **Kindergarten**

**Through problem solving, reasoning, communication, representation, and connections, students should be able to....**

#### **NUMBER SENSE**

- Model, count, read, and write numbers to 99
- Count forward and back from any number by ones
- Identify positions of objects (e.g. first, last)
- Match and compare quantities to 20
- Create and model simple addition (sums to 10) and subtraction stories using concrete objects and drawings
- Model and identify halves, thirds, and fourths
- Estimate quantities

#### **GEOMETRY & MEASUREMENT**

- Name, describe, and draw squares, circles, triangles, and rectangles; describe attributes
- Identify shapes that have been rotated, reflected, or enlarged
- Explore symmetry
- Use spatial and directional words (e.g. middle, behind, next to)
- Use non standard and explore standard units to measure and compare length, weight, area, and capacity (e.g. cm, in, gr., oz)
- Use analog and digital clocks (hour and half hour), thermometers, and calendars
- Identify coins (pennies, nickels, dimes) and their values

#### **PATTERNS, RELATIONS & FUNCTIONS**

- Reproduce, describe, extend, and create color, shape, number, and letter repeating patterns
- Sort and classify objects by color, shape, and size
- Use input-output tables and simple function machines

## **PROBABILITY & STATISTICS**

- Collect and organize data in tables, lists, and simple graphs
- Construct real object graphs, simple bar graphs, and tally charts
- Explore chance (e.g. heads/tails, spinner parts)

## **GRADE 1**

**Through problem solving, reasoning, communication, representation, and connections, students should be able to.....**

### **NUMBER SENSE**

- Model, name, read, write, order, and compare numbers to 999; identify value of the digits
- Skip count by 2s, 5s, 10s, 25s, and 100s
- Model, create, and solve addition and subtraction problems; know facts through 20
- Explore 2-digit addition and subtraction; describe their meaning and their relationships
- Investigate fractions as equal parts of whole and parts of a group; identify halves, thirds, and fourths; solve problems with fractions
- Estimate quantities and measures; use estimation language (e.g. about, near, more than)

### **GEOMETRY & MEASUREMENT**

- Identify, describe, construct, draw, and compare squares, rectangles, triangles, circles; identify common 3-D shapes
- Identify symmetry; explore congruency

- Use a calendar; describe sequence of events
- Tell time to nearest quarter hour
- Read temperatures on a thermometer
- Identify coins and \$1 bills; find the value of a set of coins; solve simple money problems
- Measure, compare, and order common objects for length and weight using non standard and standard units (cm, gr., in, oz)

### **PATTERNS, RELATIONS & FUNCTIONS**

- Reproduce, describe, extend, and create rhythmic, shape, size, and color repeating, growing, and shrinking patterns; describe and create addition and subtraction number patterns
- Construct and solve open addition and subtraction sentences with variables
- Solve problems with input-output function machines and tables of data; find rules
- Trade coins (e.g. pennies for nickels) and units of measure (e.g. cups for quarts)

### **PROBABILITY & STATISTICS**

- Collect, organize, and represent data; use tallies, charts, tables, bar graphs, and pictographs
- Draw conclusions and make predictions based on data
- Carry out experiments to determine which outcomes are most likely
- List and count the number of combinations (e.g. ways to make \$.27)

### **Grade 2**

**Through problem solving, reasoning, communication, representation, and connections, students should be able to.....**

### **NUMBER SENSE**

- Count, identify, read, model, write, name, order, and compare numbers (using  $>$ ,  $<$ ,  $=$ ) through 1000; identify the value of the digits.
- Use ordinal and cardinal numbers
- Model and solve (using standard and non standard algorithms) 2-digit addition and subtraction problems; describe their meanings and their relationship
- Know addition and subtraction facts to 20
- Create and solve number sentences for number stories
- Explore the concept of multiplication
- Identify and model common fractions as parts of groups and a whole, and on a number line
- Find the value of a collection of coins less than \$5.00; find different ways to represent amounts of money
- Use a variety of strategies to estimate quantities to 100 and to compute and measure

## **GEOMETRY & MEASUREMENT**

- Identify, describe, compare, and draw common 2- and 3-dimensional shapes
- Describe attributes and parts of 2- and 3-dimensional shapes (e.g. number of sides, edges, faces, and angles; lengths)
- Combine and divide shapes; describe results
- Recognize congruent shapes and symmetry
- Identify parts of the day, week, month, and year; use a calendar
- Tell time to nearest 5-minute mark on digital and analog clocks
- Identify and exchange coins and bills; make change; compute values of collections of coins and bills
- Read a thermometer to the nearest degree (C & F); compare temperatures
- Select and use appropriate units (e.g. cm, m, in, ft, oz, LB, pt, gal, gr.) and tools of measure (ruler, scale, measure cups, thermometer)

## **PATTERNS, RELATIONS & FUNCTIONS**

- Reproduce, describe, extend, and create simple repeating and growing patterns (e.g. 100 chart, tables, numeric sequences involving addition and subtraction)
- Write and solve number sentences to represent mathematical situations; construct and solve open sentences with variables
- Solve problems with input-output machines and tables of data
- Describe functions related to trading (e.g. pennies for nickels, ones for tens, cups for quarts)

## **PROBABILITY & STATISTICS**

- Gather data about themselves and the environment; organize and represent data using tallies, charts, tables, bar graphs, pictographs, and Venn Diagrams; interpret the representations
- Compare data; make predictions; draw conclusions
- Use spinners, counters, coins, number cubes, and other objects to simulate probability experiments; describe likely outcomes
- Find the number of possible combinations (e.g. outfits made from 4 shirts and 2 pants)

## **Grade 3**

**Through problem solving, reasoning, communication, representation, and connections, students should be able to.....**

### **NUMBER SENSE**

- Name, write, model, order, and compare whole numbers through 9,999 and decimals through .999; identify the value of the digits; identify odd/even
- Write addition, subtraction, multiplication, and division fact families; solve problems involving addition and subtraction with multi-digits
- Multiply by 2-digit numbers; divide by single digit

- Model multiplication and division with concrete objects and arrays; describe the inverse relationship between multiplication and division); demonstrate fluency with facts through  $10 \times 10$
- Model, identify, compare, and order fractions; relate fractions to decimals (e.g.  $\frac{3}{10} = 0.3$ )
- Use a variety of mental math and estimation strategies when dealing with quantities, computation and measurement
- Select appropriate operations when computing

## **GEOMETRY & MEASUREMENT**

- Describe, model, draw, compare, and classify 2-dimensional shapes; describe attributes
- Identify lines of symmetry
- Explore types of angles and lines
- Recognize relationship between 2- and 3-dimensional shapes; identify 3-D shapes
- Combine and subdivide shapes; describe results
- Explore congruency and similarity
- Explore flips, slides, and turns with shapes
- Develop concepts of area and perimeter
- Tell time to minute on digital and analog clocks; compute elapsed time
- Select and use appropriate tools and customary and metric units to measure lengths, weight, capacity; explore conversions
- Identify negative temperatures on a thermometer

## **PATTERNS, RELATIONS & FUNCTIONS**

- Describe, extend, and create geometric and numeric patterns; make predictions; form verbal rules (e.g. What's My Rule?, Input-Output Tables)
- Investigate ratio and proportion (e.g. unit pricing, map scales)

- Locate objects in first quadrant of coordinate plane
- Write number sentences for number stories and visa versa; find missing parts of number sentences
- Apply commutative and associative properties

## **PROBABILITY & STATISTICS**

- Collect, organize, describe, and represent data (e.g. tables, charts, bar graphs, line graphs, pictographs, Venn Diagrams)
- Identify the mode and median of data
- Classify outcomes as likely, unlikely, certain, and impossible by designing and conducting experiments using spinners, counters, number cubes, coins, etc.
- Find the number of possible arrangements or combinations

## **Grade 4**

**Through problem solving, reasoning, communication, representation, and connections, students should be able to.....**

### **NUMBER SENSE**

- Name, write, interpret and order whole numbers through one million and decimals (including money notation) through hundredths; identify value of the digits
- Apply concepts of odd/even, factors/multiples
- Use a variety of models to show understanding of the 4 basic operations; select the appropriate operation when solving problems
- Model, compare, and order fractions; find equivalent fractions; relate fractions to decimals; model operations with fractions and decimals
- Know multiplication facts through 12 x 12; multiply 3-digit by 2-digit numbers
- Divide by single digit
- Apply mental mathematics and estimation when computing and measuring; determine when an estimate is appropriate; determine reasonableness of solutions

## **GEOMETRY & MEASUREMENT**

- Name, describe, model, draw, compare, and classify 2- and 3-D shapes; compare and analyze properties and attributes; identify 2-D nets for 3-D shapes; draw 3-D structures from different views
- Define and differentiate among various quadrilaterals (square, rectangle, parallelogram, rhombus, trapezoid)
- Describe and draw intersecting, parallel, and perpendicular lines, segments, rays, and angles
- Apply transformations (e.g. reflections, translations, rotations)
- Recognize congruence and similarity
- Interpret schedules
- Find areas, perimeters, and volumes
- Identify various types of angles and triangles

## **PATTERNS, RELATIONS & FUNCTIONS**

- Describe, extend, and create numeric and geometric patterns; make predictions; form generalizations
- Identify and describe patterns created by multiples
- Identify and locate points on the coordinate plane (first quadrant)
- Use variables to represent unknowns in expressions and equations; write and solve number sentences with variables; find values for variables
- Investigate proportions (e.g. unit pricing, scales)
- Apply commutative and associative properties

## **PROBABILITY & STATISTICS**

- Construct and interpret tables, charts, bar graphs, line plots, and pictographs
- Draw conclusions and make predictions based on data

- Explore the concepts of mean, median, mode, range, maximum, and minimum
- Design and conduct probability experiments; classify outcomes as likely, unlikely, impossible, and certain
- Find combinations and arrangements

## **Grade 5**

**Through problem solving, reasoning, communication, representation, and connections, students should be able to.....**

### **NUMBER SENSE**

- Represent, rename, order, and compare very large numbers through trillions and very small numbers through thousandths; use expanded and exponential notation; identify value of the digits
- Round whole numbers, fractions, and decimals
- Solve problems involving fractions, decimals, and percents; describe relationships among them
- Model, compare, and order fractions and decimals; find equivalent fractions; convert mixed numbers
- Compute with multi-digit whole numbers and decimals (including percents); add and subtract fractions; estimate and check results
- Interpret remainders in division
- Apply Order of Operations
- Explore distributive property
- Apply concepts of prime/composite, odd/even, factor/multiple
- Use models to explore integers and computations with integers; compare and order integers

### **GEOMETRY & MEASUREMENT**

- Identify properties of polygons and solids

- Match 3-D objects to their 2-D nets; draw 3-D structures from different views
- Identify points, lines, segments, rays, planes, and angles; describe the relationships among them
- Classify triangles and angles; measure angles
- Graph points in 4 quadrants of the coordinate plane; identify location of points
- Perform and describe transformations (reflections, translations, rotations); explore tessellations
- Determine if shapes are congruent/similar
- Explore the concepts of radius, diameter, circumference, Pi and area of a circle; describe the relationships
- Apply area, perimeter, and volume to the solution of problems; find volume of rectangular prism; explore area of parallelogram and triangle
- Solve problems involving proportional relationships and units of measure (e.g. time, rates, speed, money)

## **PATTERNS, RELATIONS & FUNCTIONS**

- Extend and generalize numeric and geometric patterns; make predictions; use tables and graphs; generalize verbal rules
- Use concrete materials to develop concepts of equality and inequality, and how to maintain these relationships (e.g. use pan balance to model equations and inequalities)
- Use variables to represent unknowns in expressions and equations; find the value of variables

## **PROBABILITY & STATISTICS**

- Collect and organize data; construct and interpret tables, stem and leaf plot, line plot, circle graph
- Match representations of data to sets of data
- Describe data sets using the mean, median, mode, range, maximum, and minimum

