

Mathematics

First Grade

Program Goal

The learner will develop and integrate mathematical strategies necessary to become a logical thinker, problem solver, competent communicator, responsible, successful, life-long learner and productive citizen in an ever-changing world. The learner will apply math concepts to real-world situations including those related to human dignity and Catholic Social Teaching.

Grade Level Goal

In first grade, the learner will participate in a wide variety of math activities. The learner will demonstrate an understanding of addition and subtraction concepts using a variety of manipulatives and mental strategies. The learner will begin to develop problem solving skills and be able to apply them in real world situations.

Content Criteria

Functions

- The learner will identify numeric, geometric and other patterns.
- The learner will create and extend patterns.
- The learner will sort, classify, and order objects by attributes.
- The learner will use simple numeric patterns to solve problems.

Measurement

- The learner will describe, draw, compare and categorize two-dimensional shapes.
- The learner will identify three-dimensional shapes.
- The learner will demonstrate use of geometric vocabulary to describe shapes.
- The learner will demonstrate understanding of directional and positional words.
- The learner will identify shapes with symmetry.
- The learner will identify and compare units of time.
- The learner will tell time to the hour and half hour.
- The learner will name and state the value of coins.
- The learner will demonstrate an awareness of how to count mixed groups of coins to \$1.00.
- The learner will estimate and compare linear, mass, liquid and temperature measurements using standard/non-standard units.

Data Analysis

- The learner will collect, organize and display data using a variety of formats.
- The learner will construct, read and interpret more complex types of graphs.
- The learner will use information from graphs to solve problems and make comparisons.
- The learner will make predictions based on concepts of probability.

Numeration

- The learner will model, read, write, compare and order numbers to 100.
- The learner will count forward and backwards 1-100 starting from any number.
- The learner will use ordinal numbers to identify position.
- The learner will identify the value of the digits in numbers 1-100.
- The learner will sort objects into groups of tens and ones and write the numeral.
- The learner will use manipulatives to model halves, thirds, and fourths.

- The learner will read and write symbolic representation of $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{3}$.

Operations

- The learner will demonstrate the concepts of addition and subtraction.
- The learner will develop strategies to learn basic facts in addition and subtraction to 18.
- The learner will demonstrate knowledge of basic addition and subtraction facts to 10.
- The learner will read and write addition and subtraction problems using horizontal and vertical formats.
- The learner will complete addition and subtraction fact families.
- The learner will demonstrate different representations of the same number, i.e., $7 = 5 + 2$, $4 + 3$, $8 - 1$, etc.
- The learner will write and solve number sentences and math stories.
- The learner will use manipulatives to demonstrate regrouping concepts.

Applications

- The learner will use a variety of math tools to solve problems.
- The learner will apply math concepts and the problem solving process to real-world situations including issues related to human dignity and Catholic Social teaching.

Instructional Criteria

- The learner will demonstrate good listening skills and the ability to take turns.
- The learner will follow rules for working independently and cooperatively.
- The learner will follow rules for using manipulatives and measurement tools.
- The learner will follow written and oral directions.
- The learner will participate in class discussions using appropriate math vocabulary.

- The learner will write numerals and math symbols legibly.
- The learner will improve fluency in addition/subtraction facts through routine practice.

Scope

I. Functions

A. Identify patterns

1. Pattern unit
 - a. AB
 - b. ABC
 - c. AABB
 - d. AAB
 - e. ABB
 - f. Variable patterns
 - g. Patterns with multiple attributes
2. Numeric
 - a. Skip counting (2's, 5's, 10's)
 - b. Pattern on 100's chart
 - c. Even/odd
3. Attribute
 - a. Color
 - b. Size
 - c. Shape

4. Rhythm, motion, and sound

B. Create/extend patterns

1. Make own pattern
2. Continue a given pattern

C. Sort, classify, and order objects

1. Sort by color, shape, size
2. Classify by color, shape, size
3. Order by size

D. Use patterns to solve problems

1. 100's charts
2. Number line
3. Calculator

II. Measurement

- A. Two-dimensional shapes
 - 1. Triangle
 - 2. Rectangle
 - 3. Circle
 - 4. Square
 - 5. Rhombus
 - 6. Trapezoid
 - 7. Hexagon
 - 8. Oval
 - 9. Combination of shapes
- B. Three-dimensional shapes
 - 1. Sphere
 - 2. Cone
 - 3. Pyramid
 - 4. Cylinder
 - 5. Cube
 - 6. Rectangular prism
- C. Geometric Vocabulary
 - 1. Corners
 - 2. Sides
 - 3. Faces
 - 4. Edges
- D. Directional and positional words
 - 1. Before, after, between
 - 2. Left and right
 - 3. In front, in back, next to
 - 4. Over, under
 - 5. Inside, outside
- E. Symmetry
 - 1. Two matching sides
 - 2. Draw line of symmetry
- F. Units of time
 - 1. Seconds
 - 2. Minutes
 - 3. Hours
 - 4. Days
 - 5. Weeks

- 6. Months
- G. Telling time
 - 1. Hour
 - 2. Half-hour
 - 3. Analog
 - 4. Digital
- H. Coins
 - 1. Penny
 - 2. Nickel
 - 3. Dime
 - 4. Quarter
 - 5. Half-dollar
 - 6. Dollar
- I. Counting money
 - 1. Count pennies, dimes, nickels and quarters
 - 2. Count mixed groups of coins
 - 3. Record amounts using ¢ and \$, i.e. $27¢ = \$0.27$
- J. Standard/non-standard measurement
 - 1. Linear
 - a. Inches, feet, centimeters
 - b. Paper clips, cubes, straws, etc.
 - 2. Mass
 - a. Pounds, kilograms
 - b. Balance scale
 - 3. Liquid
 - a. Cup, pint, quart, liter
 - b. Various containers
 - 4. Temperature
 - a. Fahrenheit and Celsius
 - b. To the touch

III. Data Analysis

- A. Collect, organize, display data
 - 1. Tally marks
 - 2. Pictographs
 - 3. Bar graphs
 - 4. Tables and charts
- B. Construct, read, and interpret graphs

1. Pictographs
 2. Bar graphs
 - C. Using graphs
 1. Problem solving
 2. Comparing
 - D. Probability
 1. Predict an event's outcome
 2. Use vocabulary, i.e., certain, impossible, possible, more likely, and less likely
- IV. Numeration
- A. Numbers to 100
 1. Model whole numbers with manipulatives
 2. Read numerals 0-100
 3. Write numerals 0-100
 4. Compare numbers
 - a. Greater than, less than, equal to
 - b. Before, after, between
 5. Order numbers
 - c. Greatest to least
 - d. Least to greatest
 - B. Counting
 1. Count forward by 1's, 2's, 5's, 10's
 2. Count forward starting at any number 0-100
 3. Count backward starting at any number 0-100
 - C. Ordinal numbers
 1. Ordinal words (first)
 2. Ordinal numbers (1st)
 - D. Place value
 1. Ones place
 2. Tens place
 - E. Groups of tens and ones
 1. Model two-digit numbers
 2. Write two-digit numbers
 - F. Modeling fractions
 1. Halves, thirds, fourths of a whole
 2. Halves, thirds, fourths of a set
 - G. Read and write fractions

1. Halves, $\frac{1}{2}$, one half
2. Thirds, $\frac{1}{3}$, one third
3. Fourths, $\frac{1}{4}$, one fourth

V. Operations

A. Concepts of addition/subtraction

1. Addition - putting together
2. Subtraction
 - a. Take away
 - b. Comparing (How many more?)
3. Properties of zero and one

B. Addition/Subtraction strategies to 18

1. Addition
 - a. Counting on
 - b. Using objects
 - c. Draw picture
 - d. Number line
 - e. Doubles
 - f. Doubles plus one
 - g. Touch math
2. Subtraction
 - a. Counting back
 - b. Using objects
 - c. Draw pictures
 - d. Number line
 - e. Doubles
 - f. Touch math
 - g. Using addition facts

C. Addition/subtraction facts

1. Recite facts to 10
2. Memorize facts to 10

D. Read and write addition/subtraction

1. Know symbols (+, -, =)
2. Horizontal format
3. Vertical format

E. Fact families

1. Complete a fact family
2. Create a fact family

- F. Concepts of equivalence
 - 1. Part/whole ($7=5$ and 2 or $5+2$)
 - 2. Equivalent forms ($5+2 = 3+4$)
 - 3. Regrouping (3 tens and 2 ones = 2 tens and 12 ones)
- G. Math stories/word problems
 - 1. Write a number sentence from a math story
 - 2. Model or illustrate a number sentence from a math story.
 - 3. Solve a number sentence from a math story
 - 4. Tell a story for a number sentence
 - 5. Write a story for a number sentence
- H. Regrouping concepts
 - 1. Base 10 blocks
 - 2. Unifix cubes

VI. Applications

- A. Math tools
 - 1. Manipulatives
 - 2. Calculators
 - 3. Number lines
 - 4. 100's chart
 - 5. Computers
- B. Applying concepts and processes
 - 1. Problem solving process
 - a.) Understand problem
 - b.) Choose operation
 - c.) Write a number sentence
 - d.) Solve/check your answer
 - 2. Real-world applications
 - a.) Math in daily life
 - 1.) Cooking
 - 2.) Shopping
 - 3.) Schedules
 - 4.) Other
 - b.) Catholic Social Teachings
 - 1.) Fair wages
 - 2.) Environmental issues
 - 3.) Ethnic/economic differences