

# Mathematics

## Third 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

The learner will develop competency in addition, subtraction, multiplication and division and be able to use these concepts to solve mathematical problems. The learner will continue to develop problem solving skills through data analysis and by using a variety of measurement techniques.

### Content Criteria

#### Functions

- The learner will identify a pattern.
- The learner will demonstrate how to continue a pattern.
- The learner will demonstrate how to create a pattern.
- The learner will describe the relationship within a pattern.

#### Measurement

- The learner will identify the types of plane figures.
- The learner will identify types of geometric figures.

- The learner will be able to compare and contrast plane and geometric figures.
- The learner will be able to identify polygons.
- The learner will sort polygons, irregular, and non-polygons.
- The learner will be able to identify and create 3-dimensional figures.
- The learner will identify and describe geometric concepts.
- The learner will match congruent figures.
- The learner will draw lines of symmetry.
- The learner will create patterns using manipulatives inside an existing space.
- The learner will describe location of objects using directions.
- The learner will recognize appropriate units of measurement for length, capacity, weight, time, and temperature.
- The learner will determine elapsed and predicted time to the minute.
- The learner will demonstrate the ability to count money and make change.
- The learner will demonstrate the ability to measure using the metric system.

### **Data Analysis**

- The learner will demonstrate an ability to collect, organize and display data using a variety of formats.
- The learner will demonstrate an ability to interpret information from charts and graphs.
- The learner will apply organized data to answer a particular question or solve a problem.
- The learner will demonstrate an ability to create, test, interpret, and draw conclusions.
- The learner will predict possible outcomes for simple experiments.

### **Numeration**

- The learner will demonstrate the ability to identify place value in a six digit number.
- The learner will demonstrate an understanding of place value when using whole numbers and decimals.

- The learner will demonstrate ability to round and estimate whole numbers.
- The learner will demonstrate an ability to identify fractions.
- The learner will demonstrate an ability to identify decimals.
- The learner will compare and contract fractions and decimals.
- The learner will compare and order whole numbers, fractions and decimals.
- The learner will demonstrate the ability to find fractional parts of a group.

### **Operations**

- The learner will recite and recall addition and subtraction facts.
- The learner will demonstrate the ability to regroup.
- The learner will demonstrate an understanding of the concepts of multiplication and division.
- The learner will recite and recall multiplication and division facts.
- The learner will apply the appropriate methods for computation.
- The learner will identify the properties of addition, subtraction, multiplication and division.
- The learner will demonstrate the ability to problem solve.

### **Applications**

- The learner will demonstrate the ability to solve mathematical statements and story problems.
- The learner will demonstrate the ability to solve problems using probability.
- The learner will demonstrate an ability to measure using repetition.
- The learner will select and utilize the appropriate tool to solve mathematical problems.

### **Instructional Criteria**

- The learner will improve proficiency in addition, subtraction, multiplication and division through routine practice.

- The learner will use knowledge and select appropriate tools of measurement to solve single and multi-step problems inside and outside the classroom.
- The learner will create, predict, test, organize, and interpret data and communicate the results in a logical format.
- The learner will work independently, with partners, in small groups or with the entire class utilizing mathematic concepts to solve real world problems.
- The learner will continue to develop problem-solving skills to become a life-long learner.

## Scope

- I. Functions
  - A. Identify patterns
    - 1. Numeric
    - 2. Geometric
    - 3. Time
    - 4. Calendar
  - B. Continue a pattern
    - 1. Skip counting by 3's and 4's
    - 2. Addition/subtraction
    - 3. Multiplication/division
    - 4. Repetition
  - C. Create a pattern
    - 1. Border designs
    - 2. Tessellations
    - 3. Numeric
  - D. Describe relationships in a pattern
    - 1. Rule for growing, shrinking, repeating
    - 2. Make predictions
    - 3. Solve problems
      - a.) Inside classroom

b.) Outside classroom

II. Measurement

A. Identify types of plane figures

1. Circle
2. Quadrilateral
  - a.) Square
  - b.) Rectangle
  - c.) Parallelogram
  - d.) Rhombus
3. Triangle
  - a.) Right
  - b.) Obtuse
  - c.) Acute
  - d.) Scalene
  - e.) Isosceles
  - f.) Equilateral

B. Identify geometric figures

1. Cube
2. Rectangular prism
3. Sphere
4. Cylinder
5. Cone
6. Pyramid

C. Compare and contrast plane and geometric figures

1. Square - cube
2. Rectangle - rectangular prism
3. Circle - sphere - cylinder
4. Triangle - pyramid - cone

D. Identify polygons, irregular polygons, and non-polygons

1. Hexagon
2. Pentagon
3. Octagon
4. Square
5. Triangle
6. Rectangle
7. Components of irregular polygons
8. Components of non-polygons

- E. Sort polygons, irregular polygons, and non-polygons
  - 1. Closed
  - 2. Open
  - 3. Sides - length and number
  - 4. Angles
- F. Identify and create 3-dimensional figures
- G. Identify and describe geometric concepts
  - 1. Angles - right
  - 2. Vertices
  - 3. Face
  - 4. Edge
  - 5. Line
  - 6. Line segment
  - 7. Ray
  - 8. Parallel Lines
  - 9. Perpendicular lines
  - 10. Intersecting lines
  - 11. Perimeter
  - 12. Area
  - 13. Volume
- H. Match congruent figures
  - 1. Flip (reflect)
  - 2. Slide (translate)
  - 3. Turn (rotate)
- I. Draw lines of symmetry
  - 1. Zero
  - 2. One
  - 3. Two
  - 4. Three
  - 5. Four
- J. Use manipulatives to fill in an existing shape.
- K. Describe locations of objects using directions
  - 1. Coordinates on a grid
  - 2. Orientation
  - 3. Directions of relative position (above, below, etc.)
- L. Appropriate units of measurement
  - 1. Length

- a.) Inches to nearest half inch
  - b.) Foot
  - c.) Yard
  - d.) Mile
- 2. Weight
  - a.) Ounce
  - b.) Pound
- 3. Temperature
  - a.) Fahrenheit
  - b.) Celsius
- 4. Capacity
  - b.) Cup
  - c.) Pint
  - d.) Quart
  - e.) Gallon
- 5. Time
  - a.) Minute
  - b.) Hour
  - c.) Day
  - d.) Month
  - e.) Year
  - f.) AM/PM
  - g.) Time line
  - h.) Analog/digital clocks
- 6. Conversion within standard measurement system
- M. Determine elapsed and predicted time to the minute
- N. Metric system
  - 1. Length
    - a.) Centimeters
    - b.) Decimeters
    - c.) Kilometers
    - d.) Meter
  - 2. Mass
    - a.) Grams
    - b.) Kilograms
  - 3. Capacity
    - a.) Milliliters

- b.) Liters
- O. Count money and make change
  - 1. Penny
  - 2. Nickel
  - 3. Dime
  - 4. Quarter
  - 5. Half dollar
  - 6. Dollar
  - 7. Five Dollars
  - 8. Estimate
  - 9. Add/subtract

### III. Data Analysis

- A. Collect, organize and display data
  - 1. Graphs
  - 2. Charts
  - 3. Grids
  - 4. Pictographs
  - 5. Time line
  - 6. Tables
  - 7. Survey
- B. Interpret information from data displays
- C. Use data to answer a question
- D. Form and test a hypothesis
  - 1. Create a tool
    - a.) Survey
    - b.) Chart
    - c.) Graph
  - 2. Test
  - 3. Interpret data
  - 4. Draw conclusions
- E. Predict outcomes

### IV. Numeration

- A. Identify place values in a 6 digit number
  - 1. In standard form
  - 2. In expanded form
  - 3. In word form

4. Using place value blocks
- B. Place value in whole numbers and decimals
  1. Comparing
    - a.) Greater than
    - b.) Less than
    - c.) Equal to
    - d.) Ordering
      - 1.) Greatest to least
      - 2.) Least to greatest
- C. Round and estimate whole numbers
  1. Nearest thousand
  2. Nearest hundred
  3. Nearest ten
- D. Identify fractions
  1. Numerator
  2. Denominator
  3. Halves
  4. Thirds
  5. Fourths
  6. Tenths
  7. Using words
  8. Using numerals
  9. Using models
  10. Mixed numbers
  11. Improper fractions
- E. Identify decimals
  1. Tenths
  2. Hundredths
  3. Greater than one
  4. Relate money to decimals
  5. Using words
  6. Using numerals
  7. Using models
- F. Compare and contrast fractions and decimals
  1. Greater than
  2. Less than

3. Equal to
4. Ordering
  - a.) Least to greatest
  - b.) Greatest to least
- G. Fractional parts of a group
- H. Equivalent fractions
- V. Operations
  - A. Addition and subtraction facts
    1. Recite
    2. Recall
    3. Know fact families through 20
  - B. Regrouping
    1. Addition to 4 places
    2. Subtraction to 4 places
    3. Multiplication (2 digit  $\times$  1 digit)
    4. Division (1 digit divisor)
  - C. Concepts of multiplication and division
    1. Rectangular arrays
    2. Repeated addition / subtraction
    3. Skip counting
    4. Equal distribution
    5. Strategies for multiplying number
      - a.) Using multiples of 10
      - b.) Using a model
      - c.) Two and three digit numbers
  - D. Multiplication and division facts
    1. Recite
    2. Recall
    3. Fact families through 10
  - E. Apply appropriate methods for computation
  - F. Identify properties of addition, subtraction, multiplication, and division.
    1. Associative property
    2. Commutative property
    3. Distributive property
    4. Properties of one and zero
  - G. Problem solving

1. Story problems
  - a.) Write
  - b.) Explain
  - c.) Multi-step
  - d.) Too much/too little information
2. Mathematical statements
  - a.) Write
  - b.) Explain
  - c.) Find missing number ( $7 + \square = 10$ ,  $7 \times \square = 14$ )
    - 1.) Addition
    - 2.) Subtraction
    - 3.) Multiplication
    - 4.) Division
    - 5.) Determine missing operation

## VI. Applications

### A. Strategies

1. Draw a picture
2. Predict and Test
3. Make a model, graph, table
4. Find a pattern
5. Solve a simpler problem
6. Use logical reasoning
7. Work backwards
8. Write a number sentences
9. Use manipulatives
10. Use mental math

### B. Probability

1. Combinations
2. Likely events
3. Certain events
4. Predictions
5. Outcomes

### C. Measuring using repetition

1. Rulers
2. Yardstick / meter stick
3. Non-standard units

### D. Appropriate tools

1. Calculator
2. Computer
3. Thermometer
4. Measurement tools
5. Clock
6. Calendar