

**MONTGOMERY TOWNSHIP SCHOOLS**

**MATHEMATICS**

Grade: 3

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**MONTGOMERY TOWNSHIP SCHOOLS**  
**1014 Route 601, Skillman New Jersey, 08558-2112**

## I. OVERVIEW

The K-5 Mathematics Program of Montgomery Township is designed to provide students with a strong content base in mathematics while promoting and instilling the skills of problem solving, communication in mathematics, making mathematical connections, and reasoning. The principle component of the district program, the *Everyday Mathematics* program, is organized into six mathematical content strands including: operations & computation, numeration, patterns/functions & algebra, data & chance, measurement & reference frames, and geometry that cover a wide variety of skills and concepts. These content strands provide a rich yet balanced curriculum. Every strand is addressed throughout all grade levels of the program. Each grade level builds on and extends concept understanding in order for children to approach each new challenge from a firmly established foundation.

Within the content of *Everyday Mathematics*, emphasis is placed on:

- A problem-solving approach based on everyday situations that develop critical thinking skills and the reversibility of concepts.
- Frequent practice of basic skills through ongoing program routines and mathematical games.
- An instructional approach that revisits topics regularly to ensure full concept development.
- Activities that explore a wide variety of mathematical content and offer opportunities for students to apply the basic fact skills to geometry, measurement, and algebra.

The *Everyday Mathematics* instructional design is developed through student interest while maximizing student learning. This design includes:

- High expectations for all students
- Concepts and skills developed over time and in a whole variety of contexts
- Balance among mathematical strands
- Dynamic real-world applications
- Multiple methods and strategies for problem solving
- Concrete modeling as a pathway to abstract understanding
- Collaborative learning in partner and small group activities
- Cross-curricular applications

Throughout the delivery of the K-5 Mathematics curriculum various tools/technology are employed including manipulatives, calculators, and computers. A strong focus of the program is on promoting high levels of mathematical thought through experiences, which extend beyond traditional computation. The program is directly correlated to the *New Jersey Core Curriculum Content Standards* and is designed to adequately prepare students for the New Jersey statewide assessment program.

## **II. RATIONALE**

The K-5 math course sequence is intended to prepare students for the fourth grade statewide assessment (ESPA - Elementary School Proficiency Assessment) and for Math Topics II and Pre-Algebra. To that end the K-5 Mathematics Program mission is two-fold: to provide students with content-specific skills and concepts, and to develop problem-solving skills and strategies, communication, and reasoning. By incorporating the above into the everyday work and play, these ideas will shape our students' ways of thinking about mathematics and foster the development of mathematical intuition, mathematical literacy, and understanding.

## **III. STANDARDS**

The Montgomery Township Mathematics Program is aligned with the NJ Core Curriculum Content Standards. These standards and their associated strands are enumerated below:

- 4.1 All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways. (A,B,C)\*
  - A. Number Sense
  - B. Numerical Operations
  - C. Estimation
  
- 4.2 All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.
  - A. Geometric Properties
  - B. Transforming Shapes
  - C. Coordinate Geometry
  - D. Units of Measurement
  - E. Measuring Geometric Objects
  
- 4.3 All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes.
  - A. Patterns and Relationships
  - B. Functions
  - C. Modeling
  - D. Procedures
  
- 4.4 All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.
  - A. Data Analysis (Statistics)
  - B. Probability
  - C. Discrete Mathematics—Systematic Listing and Counting
  - D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms

\*These letters represent cross-referencing to the district goals.

- 4.5 All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas. (A,B,C,D,E,N,U)
- A. Problem Solving
  - B. Communication
  - C. Connections
  - D. Reasoning
  - E. Representations

**Workplace Readiness Standards and Strands are enumerated below:**

- 8.1 Self – Management
  - A. Self – Management
  - B. Interpersonal Skills
- 8.2 Career Awareness
  - A. Career Awareness
  - B. Employability Skills
- 8.3 Critical Thinking
  - A. Critical thinking
- 8.4 Computer Applications
  - A. Specific Applications
  - B. Social Aspects
  - C. Research
  - D. Problem Solving
- 8.5 Technology Education  
(Engineering and Technological Design)
  - A. Nature and Impact of Technology
  - B. Design Process and Impact Assessment
  - C. Systems in the Designed World
- 8.6 Career/Technical Arts (Practical Arts)
  - A. Career Planning and Employability Skills
  - B. Consumer/Life Skills
  - C. Safety

## IV. Knowledge & Skills

### A. Knowledge

1.)

Number Grids 4.1A, Introducing the *Student Reference Book* 4.1-4.5, Tools for Mathematics 4.1A-C, Equivalent Names 4.1A, Finding Differences 4.1B, Calculator Routines 4.5 F, Money 4.2D, Solving Problems with Dollars and Cents 4.5A, Patterns 4.3A, Length-of-Day Project 4.5.

2.)

Extensions of Addition and Subtraction Facts 4.1B, Review: What's My Rule? and Math Boxes 4.5A-E, 4.3A, Parts-and-Total Number Stories 4.5A, Change Number Stories 4.2D, 4.5A-E, Comparison Number Stories 4.1A, 4.5A-E, The Partial-Sums Algorithm 4.1A, The Trade-First Subtraction Algorithm 4.1A, Addition with Three or More Addends 4.1A.

3.)

The "Class Shoe" Unit of Length 4.2D, Measuring with a Ruler 4.2D, Standard Linear Units 4.2D, Perimeters 4.2A, Explorations: Exploring Perimeter and Area 4.2A, Area 4.2A, Number Models for Area 4.2D, 4-5A, Diameter and Circumference 4.2A, D.

4.)

Multiples of Equal Groups 4.1B, Multiplication Arrays 4.1B, Equal Shares and Equal Groups 4.1A,B, Division Ties to Multiplication 4.1A,B, Multiplication Fact Power and Shortcuts 4.1A,B, The Multiplication/Division Facts Table and Fact Families 4.1A,B, Baseball Multiplication 4.1A,B, 4.5A, B, C, Explorations: Exploring Arrays and Facts Estimating Distances with a Map Scale 4.1A,B, 4.5 A-E.

5.)

Place Value Through Ten-Thousands 4.1A, 4.3A, 4.5 A-E, Reading, Writing, and Ordering Numbers 4.1A, 4.3A, Place Value to Millions 4.1A, 4.3A, Application: The US Census 4.1A, 4.4A, 4.5 A-E, Very Large Numbers 4.1A, 4.3A, Explorations: Exploring Base-10 Blocks, Polygons, 4.1A,B, 4.5 A-E, Perimeter, and Area 4.2A, D, Decimals with Base-10 Blocks 4.1A, 4.3A, Tenths and Hundredths 4.1A, 4.3A, Tenths and Hundredths of a Meter Application: Rainfall 4.1A, 4.4A, 4.5 A-E, Place Value in Decimals 4.1A,B, 4.3A, Sunrise-Sunset Line Graphs 4.4A, 4.5 A-E.

6.)

Investigating Line Segments, Rays, and Lines 4.2A, Parallel and Intersecting Line Segments, Rays, and Lines Angles and Turns 4.2A,B, Triangles 4.2A, E, Quadrangles 4.2A, E, Polygons, or N-Gons 4.2A, E, Drawing Angles 4.2A, E, Measuring Angles 4.2A, E, Symmetry 4.2A, E, Explorations: Exploring Congruence, Counting, and Decimals 4.1A, 4.2A, E, 4.3A, Polyhedrons Part 1 4.2A, E, Polyhedrons Part 2 4.2A, E.

7.)

Patterns in Products 4.1A, 4.3A, Multiplication Facts Survey 4.1A, 4.4A, Fact Power 4.1A, Writing Number Models with Parentheses 4.1A, 4.3C, Scoring in Basketball: an Application 4.4A, 4.5A-E, Extended Facts: Multiplication and Division 4.1A, 4.3A, Estimation Costs 4.1C, Extended Facts: Products of Ten 4.1A, 4.3A, Explorations: Exploring Ratios and Geometric Figures 4.3A, 4.4 A-D.

8.)

Naming Parts with Fractions 4.3A, Explorations: Exploring Fractions, Re-Forming Squares, and Combinations 4.3A, 4.2A, B, 4.4B, Number Line Posters for Fractions 4.1A, Equivalent Fractions 4.1A, Comparing Fractions 4.1A, Fractions Greater Than ONE 4.1A, 4.3A, Fractions in Number Stories 4.1A, 4.5A-E.

9.)

Multiply and Divide with Multiples of 10, 100, and 1000 4.1A, 4.3A, Use Mental Math to Multiply 4.1A, Explorations: Exploring Arrays, Areas, and Fractions 4.1A, 4.2A, E, 4.3A, A Multiplication Algorithm 4.1A, Buying at the Stock-up Sale 4.1B, 4.5A-E, Factors of Whole Numbers 4.1A, Sharing Money 4.2D, Broken-Calculator Division 4.1B, Lattice Multiplication 4.1B, Explorations: Exploring Arrays, Equilateral Triangles, and Strength of Paper 4.1B, 4.2A, 4.5A-E, Products of 2-Digit Numbers, Part 1 4.1B, Products of 2-Digit Numbers, Part 2 4.1B, Positive and Negative Numbers 4.1A,B.

10.)

Review: Length 4.2D,E, Volume 4.2A,D, E, Explorations: Exploring Volume 4.2A,D, E, Weight and Volume Capacity 4.2A, D, E, The Mean and the Median 4.4A, Calculating the Mean 4.1B, 4.4A, Calculator Memory 4.3A, Frequency Distributions 4.4A, Coordinate Grids 4.2C.

11.)

The Language of Chance Events 4.4B, Pattern-Block-Toss Experiment 4.4B, Coin-Toss Experiment 4.4B, Spinner Experiments 4.4B, Designing Spinners 4.4B, 4.5A-E, Blocks-in-a-Bag Experiment 4.4B, Using Data to Predict Outcomes 4.4A, B, The Length-of-Day Project Revisited 4.4A, 4.5 A-F, National High/Low Temperatures Summaries 4.4A, 4.5A-F.

## B. Attitudes

The student will:

1. appreciate that mathematics is a part of everyday life. (4.5C)
2. develop an understanding that numbers have meaning. (4.5B,C, D, E)

## V. STRATEGIES

Students will be involved in cooperative learning and individual study throughout mathematics instruction. Much of the instruction will incorporate problem-based learning, including hands-on activities, manipulatives, projects, journals, and class discussions, as well as other strategies determined by the teacher.

- Given a group or individual problem-solving situation, students will use a variety of mathematical perceptions such as seeing patterns, making comparisons, estimating amounts, etc. to deduce a solution.
- Given a set of oral or written problems, students will understand the mathematical context, recognize the operative significance of the symbols, and calculate the solutions.
- Given manipulatives, games, models, calculators, computers, and other technology, students will solve problems appropriate to the unit or skill being studied.
- Differentiating Instruction - See Appendix B: Strategies Used to Differentiate Instruction in the Math Classroom

## VI. EVALUATION

Students learning will be evaluated on a daily basis through teacher observation and anecdotal note taking. Active participation, concrete understanding of skills using manipulatives, abstract mastery of skills, and responsibility for and completion of homework assignments will be considered during the evaluation of individual students. Age appropriate and specific assessments will be given to whole classes three times a year (September, January, and May) and to individuals as often as needed.

## VII. REQUIRED RESOURCES

1. Text: Everyday Mathematics, SRA/McGraw-Hill, Chicago, IL. 2004. (ISBN# 0-07-584492-3)
2. NJ Mathematics Curriculum Frameworks (see building principal)
3. Teacher's Resource Planner Package:
  - Student Math Journals Vol. I & II
  - Teacher's Lesson Guide Vol. I & II
  - Math Masters
  - Teacher's Reference Manual
  - Home Connection Handbook
  - Minute Math+
  - Assessment Handbook
4. Software:
  - Teacher's Assessment Assistant CD Rom
  - *Exemplars* CD Rom Vol. I & II

## VIII. SCOPE AND SEQUENCE

### Unit 1            Numbers and Routines

- 1.1 Numbers All Around Museum
- 1.2 Number Grids
- 1.3 Introducing the *Student Reference Book*
- 1.4 Tools for Mathematics
- 1.5 Tools for Mathematics
- 1.6 Equivalent Names
- 1.7 Finding Differences
- 1.8 Calculator Routines
- 1.9 Money
- 1.10 Solving Problems with Dollars and Cents
- 1.11 Patterns
- 1.12 Length-of-Day Project
- 1.13 Review and Assessment

## **Unit 2          Adding and Subtracting Whole Numbers**

- 2.1 Fact Families
- 2.2 Extensions of Addition and Subtraction Facts
- 2.3 Review: What's My Rule? and Math Boxes
- 2.4 Parts-and-Total Number Stories
- 2.5 Change Number Stories
- 2.6 Comparison Number Stories
- 2.7 The Partial-Sums Algorithm
- 2.8 The Trade-First Subtraction Algorithm
- 2.9 Addition with Three or More Addends
- 2.10 Unit 2 Review and Assessment

## **Unit 3          Linear Measures and Areas**

- 3.1 The "Class Shoe" Unit of Length
- 3.2 Measuring with a Ruler
- 3.3 Standard Linear Units
- 3.4 Perimeters
- 3.5 Explorations: Exploring Perimeter and Area
- 3.6 Area
- 3.7 Number Models for Area
- 3.8 Diameter and Circumference
- 3.9 Unit 3 Review and Assessment

## **Unit 4          Multiplication & Division**

- 4.1 Multiples of Equal Groups
- 4.2 Multiplication Arrays
- 4.3 Equal Shares and Equal Groups
- 4.4 Division Ties to Multiplication
- 4.5 Multiplication Fact Power and Shortcuts
- 4.6 The Multiplication/Division Facts Table and Fact Families
- 4.7 Baseball Multiplication
- 4.8 Explorations: Exploring Arrays and Facts
- 4.9 Estimating Distances with a Map Scale
- 4.10 Unit 4 Review and Assessment

## **Unit 5**            **Place Value in Whole Numbers & Decimals**

- 5.1 Place Value Through Ten-Thousands
- 5.2 Reading, Writing, and Ordering Numbers
- 5.3 Place Value to Millions
- 5.4 Application: The US Census
- 5.5 Very Large Numbers
- 5.6 Explorations: Exploring Base-10 Blocks, Polygons, Perimeter, and Area
- 5.7 Decimals with Base-10 Blocks
- 5.8 Tenths and Hundredths
- 5.9 Tenths and Hundredths of a Meter
- 5.10 Application: Rainfall
- 5.11 Place Value in Decimals
- 5.12 Sunrise-Sunset Line Graphs
- 5.13 Unit 5 Review and Assessment

## **Unit 6**            **Geometry**

- 6.1 Investigating Line Segments, Rays, and Lines
- 6.2 Parallel and Intersecting Line Segments, Rays, and Lines
- 6.3 Angles and Turns
- 6.4 Triangles
- 6.5 Quadrangles
- 6.6 Polygons, or N-Gons
- 6.7 Drawing Angles
- 6.8 Measuring Angles
- 6.9 Symmetry
- 6.10 Explorations: Exploring Congruence, Counting, and Decimals
- 6.11 Polyhedrons Part 1
- 6.12 Polyhedrons Part 2
- 6.13 Unit 6 Review and Assessment

## **Unit 7**            **Multiplication & Division**

- 7.1 Patterns in Products
- 7.2 Multiplication Facts Survey
- 7.3 Fact Power
- 7.4 Writing Number Models with Parentheses
- 7.5 Scoring in Basketball: an Application

- 7.6 Extended Facts: Multiplication and Division
- 7.7 Estimation Costs
- 7.8 Extended Facts: Products of Ten
- 7.9 Explorations: Exploring Ratios and Geometric Figures
- 7.10 Unit 7 Review and Assessment

## **Unit 8            Fractions**

- 8.1 Naming Parts with Fractions
- 8.2 Explorations: Exploring Fractions, Re-Forming Squares, and Combinations
- 8.3 Number Line Posters for Fractions
- 8.4 Equivalent Fractions
- 8.5 Comparing Fractions
- 8.6 Fractions Greater Than ONE
- 8.7 Fractions in Number Stories
- 8.8 Unit 8 Review and Assessment

## **Unit 9            Multiplication & Division**

- 9.1 Multiply and Divide with Multiples of 10, 100, and 1000
- 9.2 Use Mental Math to Multiply
- 9.3 Explorations: Exploring Arrays, Areas, and Fractions
- 9.4 A Multiplication Algorithm
- 9.5 Buying at the Stock-up Sale
- 9.6 Factors of Whole Numbers
- 9.7 Sharing Money
- 9.8 Broken-Calculator Division
- 9.9 Lattice Multiplication
- 9.10 Explorations: Exploring Arrays, Equilateral Triangles, and Strength of Paper
- 9.11 Products of 2-Digit Numbers, Part 1
- 9.12 Products of 2-Digit Numbers, Part 2
- 9.13 Positive and Negative Numbers
- 9.14 Unit 9 Review and Assessment

## **Unit 10          Measurement and Data**

- 10.1 Review: Length
- 10.2 Volume
- 10.3 Explorations: Exploring Volume

- 10.4 Weight
- 10.5 Weight and Volume
- 10.6 Capacity
- 10.7 The Mean and the Median
- 10.8 Calculating the Mean
- 10.9 Calculator Memory
- 10.10 Frequency Distributions
- 10.11 Coordinate Grids
- 10.12 Unit 10 Review and Assessment

## **Unit 11          Probability; End-of-Year Review**

- 11.1 The Language of Chance Events
- 11.2 Pattern-Block-Toss Experiment
- 11.3 Coin-Toss Experiment
- 11.4 Spinner Experiments
- 11.5 Designing Spinners
- 11.6 Blocks-in-a-Bag Experiment
- 11.7 Using Data to Predict Outcomes
- 11.8 The Length-of-Day Project Revisited
- 11.9 National High/Low Temperatures Summaries
- 11.10 Unit 11 Review and Assessment

# Third Grade *Everyday Mathematics*

## Unit 1

B	D	S	Learning Goal By Assessment Rubric Indicators
			Know basic addition facts
			Count by 10s and 100s
			Apply place-value concepts in 4-digit numbers
			Tell and show times to the nearest minute
			Count combinations of bills and coins and write the total in dollars-and-cents notation
			Find equivalent names for numbers
			Identify and use number patterns to solve problems

## Unit 2

B	D	S	Learning Goal By Assessment Rubric Indicators
			Know basic addition and subtraction facts
			Complete fact and number families
			Solve addition and subtraction multidigit number stories
			Add multidigit numbers
			Subtract multidigit numbers
			Use basic facts to solve fact extensions
			Complete "What's My Rule?" tables
			Estimate answers to multidigit addition and subtraction problems

## Unit 3

B	D	S	Learning Goal By Assessment Rubric Indicators
			Measure line segments to the nearest $\frac{1}{4}$ inch
			Measure line segments to the nearest centimeter
			Find the perimeter of a polygon
			Find the area of a rectangular region divided into square units

## Unit 4

B	D	S	Learning Goal By Assessment Rubric Indicators
			Know multiplication facts having 0 or 1 as a factor
			Know multiplication facts having 2, 5, or 10 as a factor
			Complete multiplication/division fact families
			Solve number stories involving equal groups by using multiplication
			Solve number stories involving equal sharing and equal grouping
			Know multiplication facts having 3 or 4 as one factor and 2 through 7 as the other factor

## Unit 5

B	D	S	Learning Goal By Assessment Rubric Indicators
			Read, write, and compare whole numbers up to 5 digits
			Identify place value in whole numbers up to 5 digits
			Know multiplication facts from the first set of Fact Triangles
			Compare and order decimals

			Identify place value in decimals
			Read and write 1- and 2-digit decimals
			Read, write, and compare 6- and 7-digit whole numbers
			Read and write 3-digit decimals

## Unit 6

B	D	S	Learning Goal By Assessment Rubric Indicators
			Know multiplication facts from the first set of Fact Triangles
			Identify right angles
			Identify and name 2-D and 3-D shapes
			Identify symmetric figures and draw lines of symmetry
			Identify, draw, and name line segments, lines and rays
			Draw parallel and intersecting line segments, lines and rays
			Draw angles as records of rotations

## Unit 7

B	D	S	Learning Goal By Assessment Rubric Indicators
			Recognize and know square products
			Know multiplication facts from second set of Fact Triangles
			Solve extended multiplication facts to tens x tens
			Understand function and placement of parentheses in number sentences
			Make ballpark estimates for sums and products

## Unit 8

B	D	S	Learning Goal By Assessment Rubric Indicators
			Identify fractional parts of a set
			Identify fractional parts of a region
			Identify fractions on a number line
			Find equivalent fractions
			Solve fraction number stories
			Compare and order fractions
			Convert between mixed numbers and fractions

## Unit 9

B	D	S	Learning Goal By Assessment Rubric Indicators
			Solve extended multiplication facts to hundreds x hundreds
			Solve number stories involving equal shares and equal groups
			Use the partial-products algorithm or the lattice method to multiply multidigit numbers by 1- or 2-digit numbers
			Find factors of a number
			Interpret remainders in division problems
			Solve number stories involving positive and negative numbers

## Unit 10

B	D	S	Learning Goal By Assessment Rubric Indicators
			Make a bar graph
			Find the median of a data set

			Measure in centimeters and inches
			Know units of measure
			Make a frequency table
			Know multiplication facts
			Find the volume of rectangular prisms
			Find the mean of a data set

## Unit II

B	D	S	Learning Goal By Assessment Rubric Indicators
			Understands and uses the language of probability
			Uses fractions to record probability of events
			Uses random draws to predict outcomes
			Collects and organizes data for use in predicting outcomes
			Understands area model of probability and solves simple spinner problems