

Readington Township Public Schools

Grade 2 Math

Authored and Reviewed by: Sarah Pauch
Supervisor of Math, Science, and Technology

Approval Date: August 28, 2018

Members of the Board of Education:

Laura Simon, President
Anna Shinn, Vice-President
Wayne Doran
Ray Egbert
Carol Hample
Robyn Mikaelian
Melissa Szanto
Thomas Wallace
Eric Zwerling

Superintendent: Dr. Jonathan Hart

Readington Township Public Schools
Whitehouse Station, NJ 08889
www.readington.k12.nj.us

I. OVERVIEW

Readington Township Public Schools' K-5 mathematics curriculum provides students with a strong foundation in mathematics content while promoting and instilling the skills of problem solving, communication in mathematics, making mathematical connections, and reasoning. Throughout the delivery of the K-5 mathematics program, various tools and technology are employed, including manipulatives, calculators, software, apps, videos, websites, and computing devices (computers, tablets, smart phones, interactive whiteboards, etc.). A strong focus of the program is on promoting high levels of mathematical thought through experiences which extend beyond traditional computation.

The second grade Math Expressions mathematical program is directly correlated to the New Jersey Student Learning Standards, designed to cover the topics of operations and algebraic thinking, number and operations in base ten, measurement and data analysis, and geometry while promoting and instilling the skills of problem solving and strategies, communication in mathematics, and making mathematical connections. Students will use various tools and technology in the process, including manipulatives, websites and calculators to better enhance their understanding of the concepts being taught. A significant part of the collaborative classroom's mathematical culture is the frequent exchange of mathematical ideas and problem-solving strategies through student discussions or "Math Talk".

II. STUDENT OUTCOMES [\(Linked to the New Jersey Student Learning Standards for Mathematics\)](#)

OPERATIONS AND ALGEBRAIC THINKING (2.OA)

A. Represent and solve problems involving addition and subtraction.

1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.¹

B. Add and subtract within 20.

2. Fluently add and subtract within 20 using mental strategies.² By end of Grade 2, know from memory all sums of two one-digit numbers.

C. Work with equal groups of objects to gain foundations for multiplication.

3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

NUMBER AND OPERATIONS IN BASE TEN (2.NBT)

A. Understand place value.

1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:
 - a. 100 can be thought of as a bundle of ten tens — called a "hundred."
 - b. The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2. Count within 1000; skip-count by 5s, 10s, and 100s.
3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
4. Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

B. Use place value understanding and properties of operations to add and subtract.

5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

9. Explain why addition and subtraction strategies work, using place value and the properties of operations.

MEASUREMENT AND DATA (2.MD)

A. Measure and estimate lengths in standard units.

1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.
3. Estimate lengths using units of inches, feet, centimeters, and meters.
4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

B. Relate addition and subtraction to length.

5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.
6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

C. Work with time and money.

7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?

D. Represent and interpret data.

9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems⁴ using information presented in a bar graph.

GEOMETRY (2.G)

A. Reason with shapes and their attributes.

1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.⁵ Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words *halves*, *thirds*, *half of*, *a third of*, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

III. ESSENTIAL QUESTIONS AND CONTENT

OPERATIONS AND ALGEBRAIC THINKING

Strategies for Addition and Subtraction Within 20

- How do subtraction and addition relate to one another?
- How do we use and understand numbers in our daily lives?

Subtract 2-Digit Numbers

- What are efficient methods for finding differences?
- How does the position of a digit in a number affect subtraction problems?
- How can I use what I know about money, addition, and subtraction to know how much money I have?

Arrays, Equal Shares, and Adding or Subtracting Lengths

- Can I use patterns to help me understand larger numbers?
- Can I use patterns to help me understand equal parts?
- How is measuring like using a number line?

NUMBER AND OPERATIONS IN BASE TEN

Addition Within 200

- How do we represent larger numbers?

- What computation tools should I use when adding large numbers?
- How do I know how much money I have or how much something costs?

Three-Digit Addition and Subtraction

- How do strategies assist in more efficient and accurate computation?
- What computation tools are best suited to which circumstances?

MEASUREMENT AND DATA AND GEOMETRY

Length and Shapes

- What are tools of measurement and how are they used?
- How do I draw a shape when I'm given certain attributes to use?
- When is an estimate more appropriate than an actual measurement?

Time, Graphs, and Word Problems

- What time is it when certain things happen during one day?
- How can I show information that I have collected?

IV. STRATEGIES

- Strategies may include but are not limited to:
- Teacher Presentation
- Daily Routines
- Math Talk (solve, explain, question, and justify)
- Student Pairings
- Scenarios to Act Out
- Small Group Instruction

V. EVALUATION

- Assessments may include but are not limited to:
- Teacher Observations
- Homework Assignments
- Quick Quizzes
- Performance Assessments
- Anecdotal Records
- Unit Assessments
- End of the Year Test
- NWEA Testing (Fall and Winter assessments)
- Student Collaboration-"Math Talk"(the frequent exchange of mathematical ideas and problem solving strategies)

VI. REQUIRED RESOURCES

- *Math Expressions Common Core* by Dr. Karen Fuson; Published by Houghton Mifflin Harcourt
- Homework and Remembering- Books 1 and 2
- Student Activity Book
- Activity Cards for Differentiated Instruction
- Math Center Challenge
- Assessment Guide
- Teacher's Resource Book

Supplemental Materials

- Brain Pop
- IXL Math
- Reflex Math

VII. SCOPE AND SEQUENCE

OPERATIONS AND ALGEBRAIC THINKING

Strategies for Addition and Subtraction Within 20 (30 days)

- Strategies for Addition and Subtraction
- Addition and Subtraction Word Problems
- Complex Word Problems (multi-step, missing information, etc.)

Subtract 2-Digit Numbers (32 days)

- Totals of Mixed Coins and Bills
- Multi-digit Subtraction Strategies
- Word Problems using Addition and Subtraction within 100

Arrays, Equal Shares, and Adding or Subtracting Lengths (20 days)

- Arrays and Equal Shares
- Relate Addition and Subtraction to Length with Number Lines and Actual Measurements

NUMBER AND OPERATIONS IN BASE TEN

Addition Within 200 (25 days)

- Using Place Value
- Add 2-Digit Numbers
- Money and Fluency for Addition with 100

Three-Digit Addition and Subtraction (22 days)

- Understanding Numbers to 1,000
- Adding to 1,000
- 3-Digit Addition and Subtraction

MEASUREMENT AND DATA AND GEOMETRY

Length and Shapes (16 days)

- Measuring Length
- Recognizing and Drawing Shapes
- Estimate and Measure with Centimeters and Inches
- Make Line Plots from Measurements

Time, Graphs, and Word Problems (20 days)

- A.M. and P.M. Concepts
- Time to Five Minutes
- Read, Make, and Problem-solve with Bar Graphs