Readington Township Public Schools

Grade 2 Math

Authored by: Donna Kwiatkowski-Belt
Reviewed by: Sarah Pauch
Supervisor of Math, Science, and Technology

Approval Date: **August 18, 2020**

Members of the Board of Education:
Laura Simon, President
Anna Shinn, Vice-President
Ray Egbert
Carol Hample
Robyn Mikaelian
Carol Podgorski
Andrew Saunders
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 in on promoting high levels of mathematical thought through experiences which extend beyond traditional computation.

The second grade Ready Classroom 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 discourse.

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.

Mathematical Practices
1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning

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. **ACCOMMODATIONS**

- **[Accommodations and Modification Addendum](#)**

VI. **ASSESSMENTS**
- **Formative**
  - o Independent student work
  - o Ready Classroom Lesson Quizzes
  - o Teacher Observations
  - o Class Participation
  - o Class Discussions
  - o Class Assignments
  - o Homework Assignments
  - o Notebooks
  - o Anecdotal Records
- **Summative**
  - o Mid-Unit Test
  - o Unit Test
- **Alternative**
  - o Live Online Assessment Tools (Quizizz, Kahoot, Plickers, Quizlet, Brainpop)
  - o Student Projects
  - o Student Presentations
  - o Self-Assessments
- **Benchmark** (given September, March, and June)
  - o I-Ready Diagnostic
  - o Performance Assessments
  - o Reflex Mathematics

MATERIALS
- **Core**
    - o   Ready Classroom Mathematics, Curriculum Associates, LLC
    - o   Teacher Manual Volumes 1 & 2
    - o   Student Books Volumes 1 & 2
    - o   Ready Classroom Teacher Toolbox
- **Supplemental Resources**
    - o   Technology
        - · Brain Pop
        - · IXL
        - · Reflex Math
        - · Online Tutorials (Learnzillion, Khan Academy, Math Antics)
        - · Online Math Games (Math is Fun, Funbrain, Cool Math Games, Math Playground)

VIII.   21ˢᵀ CENTURY SKILLS

Operations And Algebraic Thinking
- **Career Ready Practices**
    - o   **CRP4**. Communicate clearly and effectively and with reason.
      2.OA.B.2 Add and subtract within 20
      Activity: Students will use base ten blocks to add and subtract with regrouping. Students will then have to explain to a partner how and when to regroup.
- **9.2 Career Awareness, Exploration, and Preparation**
    - o   **9.2.4.A.1** Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.
      2.OA.A.1 Represent and solve problems involving addition and subtraction.
      Activity: Students will analyze results from their Diagnostic test to set learning goals for one and two step word problems.
- **Technology**
    - o   **8.1.2.B.1** Illustrate and communicate original ideas and stories using multiple digital tools and resources.
      2.OA.C.4 Work with equal groups of objects to gain foundations for multiplication.
      Activity: Students will be able to solve problems and explain their thinking to their peers using a digital platform. (ex. SmartSuite)

Number And Operations In Base Ten
- **Career Ready Practices**
    - o   **CRP1**. Act as a responsible and contributing citizen and employee.
      2.NBT.A.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
      Activity: Students will expand three-digit numbers into hundred blocks, ten sticks, and ones. Then students will work in a math group to explain their thinking.
- **9.2 Career Awareness, Exploration, and Preparation**
    - o   **9.2.4.A.4** Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
      MP3 Construct viable arguments and critique the reasoning of others.
      Activity: Teacher led discussion of how being able to present a reasonable argument and critiquing reasoning is a lifelong skill.
- **Technology**
    - o   **8.1.2.C.1** Engage in a variety of developmentally appropriate learning activities with students in other classes, schools, or countries using various media formats such as online collaborative tools, and social media.
      2.NBT.B.6 Add up to four two-digit numbers using strategies based on place value and properties of operations
      Activity: Students will record their work on a shareable document with another student, they will provide each other feedback digitally.

Measurement And Data
- **Career Ready Practices**
    - o   **CRP4.** Communicate clearly and effectively and with reason.

2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

Activity:Students will work with math partners to answer word problems involving money, they will be able to explain what bills, and coins they used as well identify the amount of each coin.

- **9.2 Career Awareness, Exploration, and Preparation**
  - o **9.2.4.A.4** Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

    2.MD.C.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately.

    Activity: Students will practice buying and selling objects around the classroom using pretend dollar bills and coins. Students will be able to give their classmates the exact change that is needed for the object.

- **Technology**
  - o **8.1.2.A.4** Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).

    2.MD.C.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

    Activity: Students will play a game on a digit platform that has them identifying as well as writing time on an analog and digit clock.

Geometry

- **Career Ready Practices**
  - o **CRP6**. Demonstrate creativity and innovation.

    2.G.A.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.

    Activity: Students will use circles and rectangles that have been partitioned into two, three, and four equal shares to create a robot. Students will be able to explain what shapes they used to create their robot and explain using the words halves, thirds, half of, a third of etc.

- **9.2 Career Awareness, Exploration, and Preparation**
  - o **9.2.4.A.1** Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.

    2.G.A.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.

    Activity: Students will analyze their math diagnostic results and set learning goals on identifying and partitioning circles and rectangles into two, three, or four equal shares.

- **Technology**
  - o **8.1.2.A.4** Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).

    2.G.A.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.

    Activity: Students will work with math partners on a digit platform identifying shapes and their attributes.

IX. PACING

Operations And Algebraic Thinking
Strategies for Addition and Subtraction Within 20
Lessons 1-5 (30 days)
- Mental Math Strategies for Addition and Subtraction
- Solve One and Two-Step Word Problems

Interdisciplinary Connections:
- *Literacy/Math*

  2.OA.B.2 Add and subtract within 20.

  SL.2.1 Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.

  L.2.4.A. Use sentence-level context as a clue to the meaning of a word or phrase.

  Activity: Working in small groups, students will incorporate new vocabulary in their discussion of strategies for solving the one and two-step word problems then write a response utilizing the new vocabulary.

Number And Operations In Base Ten
Addition and Subtraction Within 100
Lessons 6-9 (33 days)
- Addition and Subtraction Strategies with Two-Digit Numbers
- Solve Word Problems with Two-Digit Numbers

Interdisciplinary Connections:
- **Literacy/Math**
  2.OA.A.1 Represent and solve problems involving addition and subtraction.
  SL.2.2. Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.
  SL.2.2.B. Build on others' talk in conversations by linking their explicit comments to the remarks of others.
  L.2.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 2 reading and content, choosing flexibly from an array of strategies.
  Activity: Students work with a small group to share their responses to word problems. They discuss connections among different models and representations, critique approaches and solutions, and draw conclusions based on their observations.

Numbers Within 1,000
Lessons 12-19 (41days)
- Understand Three-digit Numbers
- Read, Write, and Compare Three-Digit Numbers
- Add and Subtract Three-Digit Numbers
- Add Several Two-Digit Numbers

Interdisciplinary Connections:
- **Literacy/Math**
  2.NBT.B.1.7. 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.
  W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons that support the opinion, use linking words (e.g. because, and, also) to connect opinion and reasons, and provide a concluding statement or section.
  SL.2.3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.
  Activity: Students will use a place value chart to draw a representation of the steps used in solving a three digit number problem and to label each step using the sequence words *first, next*, and *finally*. When finished, students will share their responses with a new partner using the sequence words *first, next*, and *finally*.

Measurement And Data
Length and Line Plots
Lessons 10-11, 20-27(40 days)
- Measuring in Inches and Centimeters
- Measuring in in Feet and Meters
- Estimate and Measure Length
- Compare Lengths
- Read and Make Line Plots

Interdisciplinary Connections:
o **Science/Math**
  - **2.MD.A.1.** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
    2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories.
    W.2.2. Write informative/explanatory texts in which they introduce a topic, use evidence-based facts and definitions to develop points, and provide a conclusion.
    2-LS4-1 Make observations (firsthand or from media) to collect data that can be used to make comparisons.

Activity: Students will individually measure and record their seed/plant growth in their science journal over a period of time.On a selected day, iIndividual data results are entered in a class digital Bar Graph for all to analyze.(**Insects and Plants Unit**)

Geometry
Shapes and Arrays
Lessons 28-32 (23 days)
- Recognize and Draw Shapes
- Partition Shapes
- Add Using Arrays

Interdisciplinary Connections:
- **Science/Math**
  8.1.2.A.2 Create a document using a word processing application
  2.G.A.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.
  Activity: Students will record observations of liquids in various containers on a shared Google Doc using math terms to describe findings, ie; the whole as two halves, three thirds, four fourths (**Solids and Liquids Unit**)