Readington Township Public Schools

Grade Kindergarten Math

Authored by: Kristi Dauernheim

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

Approval Date: August 18, 2020

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, smartphones, 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 program is directly correlated to the Student Learning Standards for Mathematics, which the State of New Jersey has adopted and it is designed to prepare students for the New Jersey state assessments.

In Kindergarten, instructional time focuses on two critical areas: representing and comparing whole numbers, initially with sets of objects than with written numerals, and describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics (NJSLS).

II. STUDENT OUTCOMES (Linked to New Jersey Student Learning Standards for Mathematics 2016)

Counting and Cardinality (K.CC)

A. Know number names and the count sequence.

1. Count to 100 by ones and by tens.
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).

B. Count to tell the number of objects.

4. Understand the relationship between numbers and quantities; connect counting to cardinality.
   a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
   b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
   c. Understand that each successive number name refers to a quantity that is one larger.
5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

C. Compare numbers.

6. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.[1]
7. Compare two numbers between 1 and 10 presented as written numerals.

Operations and Algebraic Thinking (K.OA)

A. Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.

1. Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings[2], sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).
4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
5. Demonstrate fluency for addition and subtraction within 5.

Number and Operations in Base Ten (K.NBT)

A. Work with numbers 11–19 to gain foundations for place value.

1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

Measurement and Data (K.MD)

A. Describe and compare measurable attributes.

1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
2. Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. *For example, directly compare the heights of two children and describe one child as taller/shorter.*

B. Classify objects and count the number of objects in each category.

3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.

Geometry (K.G)

A. Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.
2. Correctly name shapes regardless of their orientations or overall size.
3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

B. Analyze, compare, create, and compose shapes.

4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
6. Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

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

A. Counting and Cardinality

Understanding Numbers

- What are the names of numbers?
- How can I count in sequence?
- How can I count to tell the numbers of objects?

B. Geometry

Identify, Describe, and Create Shapes

- What terms can I use to describe a shape?
- How can I describe and identify the relative position of a shape?
- What are similarities and differences between two shapes?

C. Operations and Algebraic Thinking

Groups in Numbers

- What are addition and subtraction?
- What ways can I use to show addition or subtraction?
- What groups of numbers can I find in other numbers (decomposition)?

D. Number and Operations in Base Ten

Teen Numbers

- How can I show that a teen number is a group of ten and some ones?

Partners, Problem-Solving, and Tens

- How can I understand, solve, and retell problems that use math?
- How are teen numbers created?
- How can I use drawings and objects to represent teen numbers?

Teen Numbers and Problem-Solving

- What is place value?
- How can I use what I know about teen numbers to solve math problems?

E. Measurement and Data

Describe, Compare, and Classify

- What are measurable attributes?
- How do I sort objects into a category?
- What words do I use to describe and identify objects?

IV. STRATEGIES

- Interactive Smartboard Lessons
- Partner work
- Museum walks
- Math talk (students explain their thinking)
- Small Group Work
- Daily 5 Math
- Centers/ stations

V. ACCOMMODATIONS

- **Accommodations and Modification Addendum**

VI. ASSESSMENTS

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

VII. MATERIALS

- **Core**
  - Ready Classroom Mathematics, Curriculum Associates, LLC
  - Teacher Manual Volumes 1 & 2
  - Student Books Volumes 1 & 2
  - Ready Classroom Teacher Toolbox
- **Supplemental Resources**
  - **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 AND TECHNOLOGY

Counting and Cardinality

- **Career Ready Practices**
  - **CRP2** Apply appropriate academic and technical skills.
    K.CC.A.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with
    0 representing a count of no objects).
    Activity: The students will be given various objects in a brown bag. The students will count out the different objects and record in their math journal.
  - **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
    K.CC.A.3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
    Activity: Students will fill out a daily calendar and school day count. Each day adding one more. During that time students will discuss patterns in the calendar and the school day count.

- **9.2 Career Awareness, Exploration, and Preparation**
  - **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.
    K.CC.A.1 Know number names and the count sequence. 1. Count to 100 by ones and by tens.
    Activity: Students will be given an assignment to be a bank teller. The students will count out pennies and dimes to practice counting by 1's and 10's. They will then record their answers in their journals.
  - **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.
    K.CC.B.5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
    Activity: Students will be given a homework assignment to count out different items at home. Students will be asked to answer questions about how many do you need in your house, what happens if you run out? Where do you go to buy the items? Students will record their answers on a piece of paper and share out with their peers the next day.
  - **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.
    K.CC.B.5. Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.
    Activity: Students will be given a homework assignment to count out different items at home. Students will be asked to answer questions about how many do you need in your house, what happens if you run out? Where do you go to buy the items? Students will record their answers on a piece of paper and share out with their peers the next day.

- **Technology**
  - **K.CC.C.6** Compare numbers. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

8.1.2.A.2 Create a document using a word processing application
Activity: The students will make a document with pasting in pictures and then typing the correlating number to the pictures.

- **K.CC.C.6** Compare numbers. Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.
  8.1.2.A.2 Create a document using a word processing application
  Activity: The students will make a document with pasting in pictures and then typing the correlating number to the pictures.

Geometry

- **Career Ready Practices**
  - **CRP4.** Communicate clearly and effectively and with reason.
    K.G.B.4 Analyze, compare, create, and compose shapes. 4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
    Activity: Students will sort 3- D shapes by their attributes. Students will then do another sort to show another way. Students will then explain to their partner how and why they sorted the shapes.
- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.4.A.2** Identify various life roles and civic and work-related activities in the school, home, and community.
    K.G.B.5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
    Activity: The students will be assigned to work with a partner and create a structure using at least 4 different shapes that would be able to hold a small wooden block. Students will then share out what was created and what they learned.
- **Technology**
  - **8.1.2.A.5** Enter information into a spreadsheet and sort the information.
    K.G.A.3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").
    Activity: Students will explore the internet for 2- D and 3-D shapes. They will copy and paste the shapes into a document, while sorting them into the appropriate categories.

Operations and Algebraic Thinking

- **Career Ready Practices**
  - **CRP6.** Demonstrate creativity and innovation.
    K.OA.A.2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
    Activity: Students will work with a partner. Each student will create number stories using manipulatives from the classroom. The partner will solve the problem on their whiteboards.
- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.4.A.2** Identify various life roles and civic and work-related activities in the school, home, and community.
    K.OA.A.1. Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2 , sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
    Activity: Students will be given an assignment for homework to ask their parents, grandparents, and/ or neighbors how do they solve word problems. Are word problems part of their job?
- **Technology**
  - **8.1.2.A.4** Demonstrate developmentally appropriate navigation skills in virtual environments (i.e. games, museums).
    K.OA.A 1. Represent addition and subtraction up to 10 with objects, fingers, mental images, drawings2 , sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
    Activity: Students will use a technology device to help solve word problems.

Number and Operations in Base Ten

- **Career Ready Practices**
  - **CRP2.** Apply appropriate academic and technical skills.

K.NBT.A.1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
Activity: Students will be given a homework assignment to collect objects from around the house. The students will then create equations representing, for example 17+10+7, then try another way. Students will then share out with their peers their collection and equations.

- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.4.A.4** Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.
    K.NBT.A.1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
    Activity: Students will work in small groups. They will use base tens and ones to create and solve various equations.
- **Technology**
  - **8.1.2.A.2** Create a document using a word processing application
    K.NBT.A.1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.
    Activity: Students will use the computer to show teen numbers represented with groups of tens and ones.

Measurement and Data

- **Career Ready Practices**
  - **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
    K.MD.B.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.
    Activity: The students will be given a tray of 15 different objects. Students will work with a partner to sort their objects; shape, size, color, or any other way. Students will record their answers in their math journals. They will then try another sort.
- **9.2 Career Awareness, Exploration, and Preparation**
  - **9.2.4.A.3** Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.
    K.MD.A.2. Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.
    Activity: Students will be given a homework assignment to ask family members a question about what they like or dislike, for example pizza versus hamburgers. Students will record the data and then be asked to share out key information about their findings. Who many people liked pizza? How many more people liked hamburgers than pizza?
- **Technology**
  - **8.1.2.A.5** Enter information into a spreadsheet and sort the information.
    K.MD.B.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.3
    Activity: Students will collect information from another kindergarten classroom. They will input their results in a spreadsheet that will generate a graph. They will then discuss their findings with the other students.

IX. PACING

A. Counting and Cardinality

Understand Numbers 0-5
Lessons 1-5 (25 days)

- Understand Counting
- Count and Write to 5
- Compare Within 5

Interdisciplinary Connections:
Literacy/ Math

- **K.CC.B.4** Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

  SL.K.5. Add drawings or other visual displays to descriptions as desired to provide additional detail.

  Activity: Students will draw pictures to represent objects from 0-5.

Science/ Math

- **K.CC.B.4. A** When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.

  K-PS2-2. Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*

  Activity: Students will create different types of ramps. The students will roll objects down the ramp. The students will count out more than one to roll at times, deciding if having more objects slows or speeds up the push.

Understand Numbers 6-10, Teen Numbers, and Counting to 100

Lessons 6-9, 27, 29, 30 (30 days)

- Count and Write to 10
- Understand 1 More
- Compare Within 10
- Sort and Count Objects

Interdisciplinary Connections:

Literacy/ Math

- **K.CC.B.5.** Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1–20, count out that many objects.

  SL.K.1 Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

  Activity: Students will work with a peer. They will group objects and discuss "how many?", adding and subtracting to become more familiar math vocabulary.

Science/ Math

- **K.CC.A.** Know number names and the count sequence.

  K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.

  Activity: The students will keep a weather calendar. At the end of the month, they will count the different types of weather . "How many cloudy days?" for example.

B. Geometry

Shapes

Lessons 12-15 (21 days)

- Name Shapes
- See Position
- Compare Shapes
- Build Shapes

Interdisciplinary Connections:

Literacy/ Math

- **K.GO.A.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

  W.K.2. Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.

  Activity: Students will draw a picture using various shapes in their journal. Then label the shapes describing where it is.

Math/ Science

- **K-PS2-2.** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.*

  K.G.B.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

Activity: The students will use 3-D shapes to create a ramp and test other 3- D objects. The students will record their observations.

C. Operations and Algebraic Thinking

Addition and Subtraction

Lessons 10-11, 16-25 (50 days)

- Understand the Process of Addition and Subtraction Within 5
- Add and Subtract Within 10
- Find Missing Parts of 10
- Solve Word Problems

Interdisciplinary Connections:

Literacy/ Math

- **K.OA.A.3.** Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1).

  W.K.8. With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

  Activity: Each lesson begins with a **Start** question that helps students connect to prior learning experiences. They may draw, write, or use words or symbols to communicate information they recall.

Science/ Math

- **K.OA.A.5.** Demonstrate fluency for addition and subtraction within 5.

  K-2-ETS1-2. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

  Activity: The students will draw and create a number story. The students will then write words to help explain their word problem. They can choose an addition or subtraction word problem.

D. Number and Operations in Base Ten

Teen Numbers and Counting by 1s and 10s

Lessons 26, 28, (25 days)

- Understand Concept of Teen Numbers
- Count and Make Teen Numbers
- Count to 100 by Ones and Tens

Interdisciplinary Connections:

Literacy/ Math

- **SL.K.1.** Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.

  K.NBT.A.1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

  Activity: The students will be given various math problems. They will then talk through their understanding as a class.

Social Studies/ Math

- **6.1.4.C.5** Explain the role of specialization in the production and exchange of goods and services.

  K.NBT.A.1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

  Activity: The students will be given various math problems. They will then talk through their understanding as a class.

E. Measurement and Data

Describe, Compare, and Classify

Lessons 31-32 (11 days)

- Describing objects with measurable attributes (length, height, weight)
- Comparing objects using measurable attributes

Interdisciplinary Connections:

Science/ Math

- **K-PS2.2** Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

  K.MD.A.2. Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. For example, directly compare the heights of two children and describe one child as taller/shorter.

  Activity: The students will be asked to create a ramp system. The students will then measure how far an object rolled. The students will compare the objects, for example the marble rolled father than the tennis ball.

Literacy/ Math

- **SL.K.4.** Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.

  K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. 2. Directly compare two objects with a measurable.

  Activity: Students will work with a peer to discuss the similarities and differences among objects. Giving as much detailed information as possible.