Grade 2 Math Unit 3

Content Area: **Mathematics**
Course(s):
Time Period: **Trimester 3**
Length: **59 days**
Status: **Published**

Brief Summary of Unit

In this unit, students will begin with measurement. Students will measure the lengths of objects using a variety of tools. They will learn about different units of length and compare and estimate lengths. Students will also be solving problems that involve adding and subtracting lengths, and they organize length data in a line plot. The students will extend their knowledge of measuring lengths to the use of standard units, focusing on inches, feet, yards, centimeters, and meters. Students will learn more about measuring in standard units as they measure the lengths of objects to the nearest inch, foot, centimeter, yard, and meter. They will learn to select and use appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes in order to measure the lengths of objects. Students will describe the inverse relationship between the size of a unit and the number of units needed to measure an object. Students will also expand on the concept of unit of measure as they measure the length of an object using two different units of measure in whole number units. They will use tools to measure standard units, estimate lengths, and determine the appropriate tool to use in measuring. Students will recognize the need for comparing within a single unit and estimate lengths based on an understanding of units of measure. The students will also use open number lines to solve addition and subtraction problem situations involving adding to, taking from, putting together, taking apart and comparing. Students will then learn about shapes and will become more sophisticated in distinguishing among shapes and in their use of attributes. Students will extend their understanding of fractions to thirds by partitioning squares, circles, and rectangles. Students will also extend their understanding of shapes and attributes by grouping them into broad categories of triangle, quadrilateral, pentagon, and hexagon. They will explore the concept of an array as a rectangular shape. Toward the end of the unit, students will work toward fluency with sums to 20. They will continue to use addition equations and skip-counting to model addition. Finally, students will continue to develop skip-counting abilities and deepen their understanding of equality by learning about even and odd numbers.

Revision Date: August 2024

Essential Questions/Enduring Understandings

Essential Questions:

- How can we decide on appropriate units of measurement? (i.e. inch, foot, yard, centimeter, meter)
- Why is it important for us to know how to measure different objects using different tools of measurement?
- How can we tell if an estimate is reasonable?
- How can using a number line help us when we are solving math problems?
- How do we describe geometric figures?

- How do we apply the use of fractions in everyday life?
- How do we know how many fractional parts make a whole?
- How do I determine if a number is odd or even and what strategies can I use?
- How are arrays and repeated addition related?

Enduring Understandings:

- Students will understand all aspects of measuring with standard units using a variety of standard measuring tools. They will understand how to choose appropriate tools, compare measurements, and solve word problems involving length.
- Students will work with shapes and understand that knowing the number of sides and angles a shape has can help you identify the shape. Students will use what they know about dividing a shape into equal parts to show halves, thirds, and fourths.
- Students will understand that an array is an arrangement of objects in equal rows and columns. They will use what they know about addition and skip-counting to find the number of objects in an array.

Students Will Know/Students Will Be Skilled At

Students will know:

- How to understand that the lengths of objects can be measured by using different standard units
- How to compare measuring the length of an object in inches with measuring the length of an object in centimeters
- How to choose a tool for measuring the length of a given object
- How to use a ruler repeatedly to measure length
- How to compare lengths measured in different units
- How to understand the relationship between feet and inches and between feet and yards
- How to understand the relationship between centimeters and inches and between centimeters and meters
- That the number of units in a measurement is related to the size of the units used
- How to compare the length of objects by determining which measure is greater than or less than the other
- How to recognize the importance of working within a single unit when adding or subtracting lengths
- How to interpret marks on a line plot as data

- That the numbers on a ruler or number line can be used to represent a given length
- How to distinguish among triangles, quadrilaterals, pentagons, and hexagons based on their attributes.
- How to recognize that fractional parts are equal in size
- How to understand that the more parts a whole is divided into, the smaller the size of each part
- How to analyze an array of square with no gaps or overlaps
- How to describe an array of up to 5 rows and 5 columns
- How to relate doubles and doubles +1 facts to odd and even numbers

Students will be skilled at:

- Representing and measuring the lengths of objects using different tools, such as inch and centimeter rulers
- Measuring lengths by using rulers, yardsticks, meter sticks, and measuring tapes
- Estimating length in inches, centimeters, feet, and meters
- Using benchmark objects when estimating
- Using addition and subtraction to compare lengths, finding how much greater or less the measure of one object is than the other
- Using addition and subtraction to solve problems involving lengths
- Interpreting and applying models that represent measurement problems involving addition and subtracting
- Representing a whole number as a length from 0 on a number line
- Using a number line to represent and solve addition problems
- Using a number line to represent and solve subtraction problems
- Using a number line to solve addition and subtraction word problems
- Representing data on a line plot
- Identifying triangles, quadrilaterals, pentagons, and hexagons based on the number of sides and angles they have
- Identifying cubes based on the number and shape of faces that are the same
- Drawing a shape based on specific attributes
- Identifying and naming halves, thirds, and fourths as parts into which a shape is divided

- Determining the number of squares used to partition a rectangle
- Creating an array of squares to fit a rectangular shape
- Calculating the number of items in an array using repeated addition and skip-counting
- Writing an equation to express the sum of items in an array
- Identifying odd and even numbers
- Using counting on by twos to identify even numbers

Learning Plan

Daily Warm-ups (5-10 minutes):

*As an opening to each math lesson, the instructor can use these different routines

- Number Talks- District Created Resource District Created Number Talk Slides
- Quick Images- This routine helps students to subitize, or "instantly see how many". The teacher should briefly show an image of a quantity (using dot cards, ten frames, etc.). Students are then asked to identify the quantity they saw and to describe the image.
- Number Strings- This routine helps to build students' mental math capabilities. The teacher writes a problem horizontally on the board in a whole group or small setting. The students mentally solve the problem and share with the whole group how they solved it. They must justify and defend their reasoning. The teacher records the students' thinking in an open number line and poses extended questions to draw out deeper understanding for all. The teacher can have students share other students' strategies to the whole group or with turn and talk. Eventually provide a few number sentences on the board to solve within 20 and model how you can use mental math strategies to solve them in a snap just like they would on a fact test, then let them try solving in a snap as you point to each number sentence.
- Buzz- Have students stand in a large circle around the room. Students will count around the room however, one number will be the "Buzz Number". When a student says the "Buzz Number" that child is "out" and will sit down, and the counting sequence begins again. Keep playing until there is only one student left.
- Partner Counting- The first partner will tell their partner a number to start counting from. The partner will start counting- using hand signals, the first partner can signal to partner to stop counting, begin counting backward and then forward again. (Hand signals: Fist = Stop, Pointing up = Count Up, Pointing Down= Count Down) They can count for 30 seconds and then switch partner roles.
- Counting Around the Room- Have students stand in a large U-Shape around the room (each child should be able to see the board). Have the students count around the room by a particular number. (If counting by 10s, the first person says "17", the next person says "27", the next "37", and so forth). Have students discuss what is happening with the numbers. While the students are counting, the teacher can be writing the numbers on the board as the students say each number for a visual to help

with scaffolding and discussion. Take note of the patterns of each place value in the discussions.

***Second graders need to be fluent in adding and subtracting within 20. This is a skill that should be worked on throughout the year utilizing the Ready Math Program and supplemental resources that are located under materials.**

1. **Before teaching Lesson 20**, the instructor can review basic concepts about measuring length to support students as they learn about measurement with different units. (Grade 1 Lesson 32) (0-2 days)

2. **Measure in Inches and Centimeters**- Instruct students to use rulers and tiles to measure the lengths of objects in inches or centimeters.

   a. **Complete Ready Math Lesson 20**, Sessions 1-4 (4 days)

   b. Main Focus:

      i. How to use a ruler to measure in Inches

      ii. How to use a ruler to measure in centimeters

   c. Lesson Vocabulary: centimeter (cm), inch (in.), length, measure, ruler, unit (review)

3. **Measure in Feet and Meters**- Instruct students to measure with different tools, such as rulers, yardsticks, meter sticks, and measuring tapes. Instruct students to choose the most appropriate tool for measuring the length of a given object. Guide students in measuring objects longer than a ruler by using the ruler repeatedly.

   a. **Complete Ready Math Lesson 21**, Sessions 1-5 (5 days)

   b. Main Focus:

      i. A standard ruler is marked in inches and centimeters. It shows 12 inches and 30 centimeters. A 12 -inch ruler is equal to 1 foot.

      ii. A yardstick is a measuring stick that is one yard long and shows 36 inches.

      iii. A meter stick is a measuring stick that is 1 meter long and shows 100 centimeters.

      iv. A measuring tape is a flexible measuring strip that shows inches and centimeters

      v. Different tools may be easier to use when measuring different objects.

   c. Lesson Vocabulary: foot (ft), measuring tape, meter (m), meter stick, yard (yd), yardstick

      i. Review: centimeter, inch, ruler

4. **Understand Measurement with Different Units**- Instruct the students to compare measurements

made in inches and feet, inches and centimeters, and other units. Students should know that when measuring an object in both feet and inches, more inches are needed to measure the object than feet.

a. **Complete Ready Math Lesson 22**, Sessions 1-3 (3 days)

b. Lesson Vocabulary to Review: centimeter, foot, inch, meter, yard

5. **Estimate and Measure Length**- Instruct students to estimate the lengths of objects using the standard units of inches, feet, centimeters, and meters. Students will be comparing their estimates to actual measurements to determine if their estimates are reasonable. Guide students to learn that being able to estimate lengths is good practice for estimating the solutions to many types of math problems.

a. **Complete Ready Math Lesson 23**, Sessions 1-4 (4 days)

b. Benchmarks to help with estimation:

i. 1 centimeter = your little finger (across)

ii. 1 inch = a quarter (across)

iii. 1 foot = the height of a notebook

iv. 1 meter= a doorway (Across)

c. Lesson Vocabulary: estimate (noun), estimate (verb)

6. **Compare Lengths**- Instruct students to compare lengths of objects within a specific unit and use addition and subtraction to find differences in length.

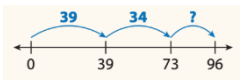
a. **Complete Ready Math Lesson 24**, Sessions 1-5 (5 days)

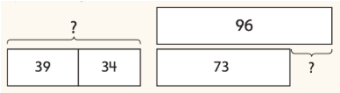
b. Lesson Vocabulary to Review: difference, length, longer, shorter

7. **Add and Subtract Lengths-** Instruct students to apply what they have learned about measuring to solve problems involving length. Students will use models to represent problems and then devise strategies to organize the information that leads to a solution.

a. **Complete Ready Math Lesson 25,** Sessions 1-5 (5 days)

b. Strategies to Solve Adding and Subtracting Lengths:

i. Open Number Line: 

ii.Bar Model: 

c. Lesson Vocabulary to Review: open number line

8. **Add and Subtract on the Number Line-** Instruct students to represent whole numbers as lengths on the number line. Students will apply what they have learned about solving addition and subtraction problems to represent and solve problems on the number line.

a. **Complete Ready Math Lesson 26**, Sessions 1-5 (5 days)

b. Lesson Vocabulary: number line

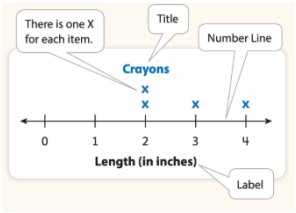
i. Vocabulary to review: difference, length, longer, shorter, taller

9. **Read and Make Line Plots**- Instruct students to organize lengths on a line plot. Students will read charts, interpret the data, and represent the data. Students will recognize that a number line can be used as a tool for organizing information.

a. **Complete Ready Math Lesson 27**, Sessions 1-5 (2-5 days)

b. Main Focus:

i. Line Plot- made up of a number line, a title, and a label that tells what is being shown. It has an x for each measurement.



c. Lesson Vocabulary: line plot

i. Vocabulary to review: data

10. **Recognize and Draw Shapes**- Instruct students to use the number of sides and angles to identify, name, and classify polygons. Students will reason logically when they generalize attributes to sets of shapes and in determining when an attribute can be applied to all of one kind of polygon, some of them,

or none of them.

a. **Complete Ready Math Lesson 28, Sessions 1-5** (2-5 days)

b. Shapes to Teach:

    i. Triangles- 3 sides, 3 angles, 3 vertices

    ii. Quadrilaterals- 4 sides, 4 angles, 4 vertices

        1. Rectangles- 4 square corners

        2. Squares: 4 square corners, all sides same length

        3. Rhombus: all sides the same length

    iii. Pentagons- 5 sides, 5 angles, 5 vertices

    iv. Hexagons- 6 sides, 6 angles, 6 vertices

    v. Cubes- 6 surfaces, or faces, that are all the same

c. Lesson Vocabulary: angle, cube, edge, hexagon, pentagon, quadrilateral, rectangle, rhombus, side, square, triangle, vertex

    i. Vocabulary to review: face

11. **Understand Partitioning Shapes into Halves, Thirds, and Fourths**- Instruct students to partition squares, circles, and rectangles into halves, thirds, and fourths, recognizing that equal parts of congruent shapes need not look identical. Students will name and compare fractional parts based on their shape and the amount of the whole they consume. For example, students partition a rectangle;e (the whole) into three equal shares, identify each of the shares as a 'third' and describe the rectangle as three 'thirds'.

a. **Complete Ready Math Lesson 29, Sessions 1-3** (2-3 days)

b. Main Focus:

    i. 2 equal parts are called halves. Each of these parts is called one half of the whole.

    ii. 3 equal parts are called thirds. Each of these parts is called one third of the whole.

    iii. 4 equal parts are called fourths. Each of these parts is called one fourth of the whole.

c. Lesson Vocabulary: one fourth, one half, one third, thirds

    i. Vocabulary to Review: fourths, halves

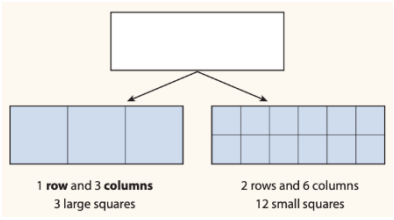
12. **Partition Rectangles**- Instruct students to build on the concept of an array and the attributes of a

rectangle as they fill a rectangular shape using congruent squares.

a. **Complete Ready Math Lesson 30, Sessions 1-4** (2-4 days)

b. Main Focus:

i. Rectangles can be partitioned into squares in different ways using rows and columns



c. Lesson Vocabulary: column, row

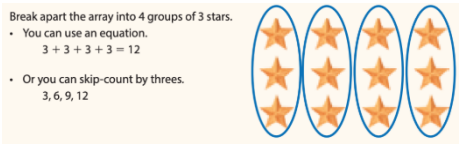
13. **<u>Add Using Arrays</u>** - Instruct students to apply their knowledge of addition, skip counting, and partitioning rectangles to arrays. Instruct students to analyze arrays, recognizing them as sets of objects organized in equal rows and columns. Students will recognize that adding 3 groups of 4 or adding 4 groups of 3 results in the same sum. This structure lays the foundation for the extension of the commutative property to multiplication.

a. **Complete Ready Math Lesson 31**, Sessions 1-4 (2-4 days)

b. Main Focus:

i. An array is a set of objects arranged in equal rows and equal columns.

ii. You can find the amount of objects in an array by breaking apart the array into groups (rows or columns) and using addition strategies.





c. Lesson Vocabulary: array

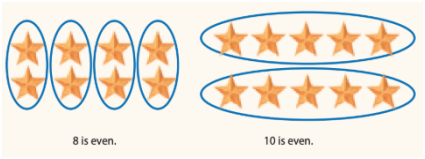
i. Vocabulary to Review: column, row

14. **<u>Even and Odd Numbers</u>**- Instruct students that even numbers can be seen as groups of 2 with no leftovers or as 2 equal groups of any number. Students should connect skip-counting by twos to the concept of even numbers. Instruct students to relate the concept of 2 equal groups to doubles facts, examine doubles +1 facts, and relate both to the structure of even and odd numbers. Students will examine odd and even numbers in a 1-20 chart and study patterns in number charts and with ones digits.

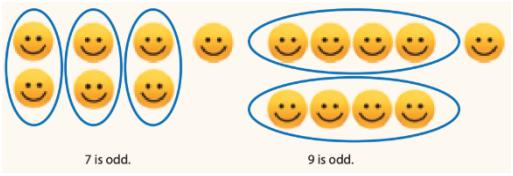
a. **Complete Ready Math Lesson 32**, Sessions 1-4 (2-4 days)

b. Main Focus:

i. An even number of objects can be put into pairs or into two equal groups without any leftovers. It will always have a 0, 2, 4, 6, or 8 in the ones place.



ii. An odd number of objects cannot be put into pairs or into two equal groups without a leftover. It will always have a 1, 3, 5, 7, or 9 in the ones place.



c. Lesson Vocabulary: even number, odd number

Note: The instructor is encouraged to consult the supplemental resources to personalize and differentiate instruction for students, as well as address any learning gaps based on formative assessments.

Evidence/Performing Tasks

<u>Formative Assessment:</u>

- Fact Fluency Practice Assessments
- Administer Ready Math Lesson Quizzes at the end of each Lesson
- Administer Comprehension Check (digital)

Summative Assessments:

- Administer Ready Math Mid-Unit Assessments
- Administer Ready Math End of Unit Assessments

Benchmark Assessments:

- iReady Diagnostic
- Fact Fluency Assessment
- Acadience Assessment

Alternative Assessments:

- Informal Observation
- Small Group Observation
- Exit Tickets
- Math Journal
- Oral and Written Explanations of Reasoning

Materials

The following are approved resources that teachers can include to further unit related objectives:

Core Book List

- Ready Math Teacher Toolbox Resources
    - Whole Class Instruction
        - Teach: Instruction & Practice, Interactive Tutorials,
        - Assess: Lesson Quizzes & Unit Assessments
    - Small Group Differentiation
        - Prepare: Prerequisite Lessons
        - Reteach: Tools for Instruction
        - Reinforce: Math Center Activities

    - Extend: Enrichment Activities

- Ready Math Workbook
- Ready Math Slides
- Digital Math Tools
- iReady My Path
- Learning Games
- Manipulatives: counters, 1-inch tiles, connecting cubes,
- Measurement Tools: Yardsticks, Meter Sticks, Measuring Tape marked in inches, Ruler with centimeters and inches
- Number lines, open number lines, bar models
- Centimeter grid paper
- Sticky notes
- Geometry Tools: color tiles, geoboards, dot paper, straws, index cards,
- Array Tools: 1-inch tiles, 1-inch grid paper, 1-centimeter grid paper, counters, connecting cubes, hundred charts, number lines

Any additional resources that are not included in this list will be presented to and reviewed by the supervisor before being included in lesson plans. This ensures resources are reviewed and vetted for relevance and appropriateness prior to implementation.

Standards

Diversity and Inclusion: Students will focus on equity, inclusion, and tolerance when analyzing the comparison of various quantities regarding characteristics of people. Equality will also be highlighted which can be associated with both numerical representations and the connection between people. This can be associated with treating people fairly and equally. Also, geometric art from the lessons about shapes incorporates various cultures. This unit also reflects the goals of the Department of Education and the Amistad Commission including the infusion of the history of Africans and African-Americans into the curriculum in order to provide an accurate, complete, and inclusive history regarding the importance of of African-Americans to the growth and development of American society in a global context. Cultural representations of geometric art also highlight the history and contributions of Asian Americans and Pacific Islanders in accordance with the New Jersey Student Learning Standards in Social Studies. The focus on the use of math in art further reflects the goals of the Holocaust Education mandate where students are able to identify and

analyze applicable theories concerning human nature and behavior.

9.4.2.CI	Creativity and Innovation
P.1	Act as a responsible and contributing community members and employee.
1	Make sense of problems and persevere in solving them
2	Reason abstractly and quantitatively
2.OA.A.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.
P.4	Demonstrate creativity and innovation.
P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
3	Construct viable arguments and critique the reasoning of others
4	Model with mathematics
2.OA.C.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.
2.OA.C.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.
5	Use appropriate tools strategically
6	Attend to precision
7	Look for and make use of structure
2.NBT.A.2	Count within 1000; skip-count by 5s, 10s, and 100s.
8	Look for and express regularity in repeated reasoning
L.RF.2.4.C	Use context to confirm or self-correct word recognition and understanding, rereading as necessary.
2.NBT.B.5	With accuracy and efficiency, add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.M.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.M.A.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.
2.M.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.M.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
2.M.B.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.
2.M.B.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.
2.DL.A.1	Understand that people collect data to answer questions. Understand that data can vary.
2.DL.A.2	Identify what could count as data (e.g., visuals, sounds, numbers).
2.DL.B.3	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.
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. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2.G.A.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
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.
SL.PE.2.1	Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups.
SL.PE.2.1.A	Follow agreed-upon norms for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion).
SL.PE.2.1.B	Build on others' talk in conversations by linking their explicit comments to the remarks of others.
SL.PE.2.1.C	Ask for clarification and further explanation as needed about the topics and texts under discussion.

Suggested Strategies for Modification

Integrated Accommodations and Modifications, Special Education students, English Language learners, At-Risk students, Gifted and Talented students, Career Education, and those with 504s

Possible accommodations/modification for Grade 2

Note: Teachers can find more specific modifications for English learners, learners with special needs,learners reading below grade level, and advanced learners on the Ready Math website.