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SCIENCE  
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HEALTH & PHYSICAL EDUCATION

RAHWAY PUBLIC SCHOOLS

# CURRICULUM & INSTRUCTION

**Course: Mathematics**

**Grade Level: 2**

This curriculum is part of the Educational Program of Studies of the Rahway Public Schools.

**Anjanette Highsmith, Program Supervisor of K-6 Math, Science, and K-12 Instructional Technology**

The Board acknowledges the following who contributed to the preparation of this curriculum.

**Siobhan Cassio & Marcia Dawkins**

**Dr. Tiffany A. Beer, Director of Curriculum and Instruction**

Subject/Course Title:  
**Mathematics**  
**Grade 2**

Date of Board Adoption:  
**August 27, 2024**

# RAHWAY PUBLIC SCHOOLS CURRICULUM

## Mathematics: Grade 2

### *PACING GUIDE*

<b>Unit</b>	<b>Title</b>	<b>Pacing</b>
1	<a href="#"><u>Adding, Subtracting, and Working with Data</u></a>	4 weeks
2	<a href="#"><u>Adding and Subtracting within 100</u></a>	4 weeks
3	<a href="#"><u>Measuring Length</u></a>	4 weeks
4	<a href="#"><u>Addition and Subtraction on the Number Line</u></a>	4 weeks
5	<a href="#"><u>Numbers to 1,000</u></a>	3 weeks
6	<a href="#"><u>Geometry, Time and Money</u></a>	5 weeks
7	<a href="#"><u>Adding and Subtracting within 1,000</u></a>	4 weeks
8	<a href="#"><u>Equal Groups</u></a>	3 weeks
9	<a href="#"><u>Putting it All Together</u></a>	3 weeks

## *ACCOMMODATIONS*

<p><b>504 Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Provide scaffolded vocabulary and vocabulary lists.</li> <li>● Provide extra visual and verbal cues and prompts.</li> <li>● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials.</li> <li>● Provide links to audio files and utilize video clips.</li> <li>● Provide graphic organizers and/or checklists.</li> <li>● Provide modified rubrics.</li> <li>● Provide a copy of teaching notes, especially any key terms, in advance.</li> <li>● Allow additional time to complete assignments and/or assessments.</li> <li>● Provide shorter writing assignments.</li> <li>● Provide sentence starters.</li> <li>● Utilize small group instruction.</li> <li>● Utilize Think-Pair-Share structure.</li> <li>● Check for understanding frequently.</li> <li>● Have student restate information.</li> <li>● Support auditory presentations with visuals.</li> <li>● Weekly home-school communication tools (notebook, daily log, phone calls or email messages).</li> <li>● Provide study sheets and teacher outlines prior to assessments.</li> <li>● Quiet corner or room to calm down and relax when anxious.</li> <li>● Reduction of distractions.</li> <li>● Permit answers to be dictated.</li> <li>● Hands-on activities.</li> <li>● Use of manipulatives.</li> <li>● Assign preferential seating.</li> <li>● No penalty for spelling errors or sloppy handwriting.</li> <li>● Follow a routine/schedule.</li> <li>● Provide student with rest breaks.</li> <li>● Use verbal and visual cues regarding directions and staying on task.</li> <li>● Assist in maintaining agenda book.</li> </ul>	<p><b>IEP Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Provide scaffolded vocabulary and vocabulary lists.</li> <li>● Differentiate reading levels of texts (e.g., Newsela).</li> <li>● Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials.</li> <li>● Provide extra visual and verbal cues and prompts.</li> <li>● Provide links to audio files and utilize video clips.</li> <li>● Provide graphic organizers and/or checklists.</li> <li>● Provide modified rubrics.</li> <li>● Provide a copy of teaching notes, especially any key terms, in advance.</li> <li>● Provide students with additional information to supplement notes.</li> <li>● Modify questioning techniques and provide a reduced number of questions or items on tests.</li> <li>● Allow additional time to complete assignments and/or assessments.</li> <li>● Provide shorter writing assignments.</li> <li>● Provide sentence starters.</li> <li>● Utilize small group instruction.</li> <li>● Utilize Think-Pair-Share structure.</li> <li>● Check for understanding frequently.</li> <li>● Have student restate information.</li> <li>● Support auditory presentations with visuals.</li> <li>● Provide study sheets and teacher outlines prior to assessments.</li> <li>● Use of manipulatives.</li> <li>● Have students work with partners or in groups for reading, presentations, assignments, and analyses.</li> <li>● Assign appropriate roles in collaborative work.</li> <li>● Assign preferential seating.</li> <li>● Follow a routine/schedule.</li> </ul>
<p><b>Gifted and Talented Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Differentiate reading levels of texts (e.g., Newsela).</li> <li>● Offer students additional texts with higher lexile levels.</li> <li>● Provide more challenging and/or more supplemental readings and/or activities to deepen understanding.</li> <li>● Allow for independent reading, research, and projects.</li> <li>● Accelerate or compact the curriculum.</li> <li>● Offer higher-level thinking questions for deeper analysis.</li> <li>● Offer more rigorous materials/tasks/prompts.</li> <li>● Increase number and complexity of sources.</li> </ul>	<p><b>ELL Accommodations:</b></p> <ul style="list-style-type: none"> <li>● Provide extended time.</li> <li>● Assign preferential seating.</li> <li>● Assign peer buddy who the student can work with.</li> <li>● Check for understanding frequently.</li> <li>● Provide language feedback often (such as grammar errors, tenses, subject-verb agreements, etc...).</li> <li>● Have student repeat directions.</li> <li>● Make vocabulary words available during classwork and exams.</li> <li>● Use study guides/checklists to organize information.</li> <li>● Repeat directions.</li> <li>● Increase one-on-one conferencing.</li> </ul>

<ul style="list-style-type: none"> <li>● Assign group research and presentations to teach the class.</li> <li>● Assign/allow for leadership roles during collaborative work and in other learning activities.</li> </ul>	<ul style="list-style-type: none"> <li>● Allow student to listen to an audio version of the text.</li> <li>● Give directions in small, distinct steps.</li> <li>● Allow copying from paper/book.</li> <li>● Give student a copy of the class notes.</li> <li>● Provide written and oral instructions.</li> <li>● Differentiate reading levels of texts (e.g., Newsela).</li> <li>● Shorten assignments.</li> <li>● Read directions aloud to student.</li> <li>● Give oral clues or prompts.</li> <li>● Record or type assignments.</li> <li>● Adapt worksheets/packets.</li> <li>● Create alternate assignments.</li> <li>● Have student enter written assignments in criterion, where they can use the planning maps to help get them started and receive feedback after it is submitted.</li> <li>● Allow student to resubmit assignments.</li> <li>● Use small group instruction.</li> <li>● Simplify language.</li> <li>● Provide scaffolded vocabulary and vocabulary lists.</li> <li>● Demonstrate concepts possibly through the use of visuals.</li> <li>● Use manipulatives.</li> <li>● Emphasize critical information by highlighting it for the student.</li> <li>● Use graphic organizers.</li> <li>● Pre-teach or pre-view vocabulary.</li> <li>● Provide student with a list of prompts or sentence starters that they can use when completing a written assignment.</li> <li>● Provide audio versions of the textbooks.</li> <li>● Highlight textbooks/study guides.</li> <li>● Use supplementary materials.</li> <li>● Give assistance in note taking</li> <li>● Use adapted/modified textbooks.</li> <li>● Allow use of computer/word processor.</li> <li>● Allow student to answer orally, give extended time (time-and-a-half).</li> <li>● Allow tests to be given in a separate location (with the ESL teacher).</li> <li>● Allow additional time to complete assignments and/or assessments.</li> <li>● Read question to student to clarify.</li> <li>● Provide a definition or synonym for words on a test that do not impact the validity of the exam.</li> <li>● Modify the format of assessments.</li> <li>● Shorten test length or require only selected test items.</li> <li>● Create alternative assessments.</li> <li>● On an exam other than a spelling test, don't take points off for spelling errors.</li> </ul>
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## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Adding, Subtracting, and Working with Data

**Target Course/Grade Level:** Mathematics/2nd Grade

**Unit Summary:** In this unit, students begin the year-long work to develop fluency with sums and differences within 20, building on concepts of addition and subtraction from grade 1. They learn new ways to represent and solve problems involving addition, subtraction, and categorical data. Students are introduced to picture graphs and bar graphs as a way to represent categorical data. They ask and answer questions about situations described by the data. The structure of the bar graphs paves the way for a new representation, the tape diagram. Students learn that tape diagrams can be used to represent and make sense of problems involving the comparison of two quantities. The diagrams also help to deepen students' understanding of the relationship between addition and subtraction.

This opening unit also offers opportunities to introduce mathematical routines and structures for centers, and to develop a shared understanding of what it means to do math and to be a part of a mathematical community. The lessons in the first section and the warm-up activities throughout the unit allow students to build on addition and subtraction within 10 fluency from grade 1 and prepare for the end-of-grade-2 fluency with addition and subtraction within 20. Number Talks are used to help further develop fact fluency and mental math strategies. As the unit progresses, students use strategies to add two-digit and single-digit numbers and two two-digit numbers. In Lessons 10 and 15, students can use mental strategies that involve composition and decomposition of numbers to create an equivalent expression to find the sum.

**Approximate Length of Unit:** 4 Weeks

## *LEARNING TARGETS*

**NJ Student Learning Standards:**

**Mathematics:**

**2.DL.B.4** 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 problems using information presented in a bar graph.

**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.

**2.OA.B.2** With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

**2.NBT.A.2** With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers

**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.

## **Interdisciplinary Connections and Standards:**

### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

### **Unit Understandings:...**

- Students will represent and solve story problems within 20 through the context of picture and bar graphs that represent categorical data.
- Students build toward fluency with addition and subtraction.

### **Unit Essential Questions:**

- How can we represent and solve addition and subtraction problems within 20 using different strategies and visual models?
- What are picture graphs and bar graphs, and how can they be used to represent categorical data?
- How do we ask and answer questions about situations described by categorical data represented in graphs?
- What is the purpose of tape diagrams, and how do they help in understanding and solving problems involving the comparison of two quantities?
- How do tape diagrams deepen our understanding of the relationship between addition and subtraction?
- What mathematical routines and structures can we use to build a shared understanding of mathematical concepts and foster a mathematical community?

- How do warm-up activities and Number Talks contribute to the development of fact fluency and mental math strategies?
- What strategies can we use to add two-digit and single-digit numbers, as well as two two-digit numbers?
- How do composition and decomposition of numbers help us find equivalent expressions and solve addition problems more efficiently?
- How does fluency with addition and subtraction within 10 from grade 1 prepare us for fluency with addition and subtraction within 20?

**Knowledge and Skills:**

*Students will know...*

- How to represent and solve problems involving addition and subtraction.
- How to add and subtract within 20.
- How to work with equal groups of objects to gain foundations for multiplication.

*Students will be able to...*

- Add and subtract within 10.
- Find the value that makes equations within 20 true.
- Write equations with unknown addends and sums of 10 and their related subtraction equations.
- Find the number that makes equations within 20 true using the relationship between addition and subtraction.
- Add and subtract within 20 in a way that makes sense to them.
- Add within 50 in a way that makes sense to them.
- 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 problems using information presented in a bar graph.
- Learn the structure of center day lessons.
- Practice adding and subtracting within 10 or 20.
- Practice adding within 50.

***EVIDENCE OF LEARNING***

**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Warm Ups
- Cool Downs
- Section Checkpoints
- Common Assessment: Illustrative Math End of Unit 2.1 Assessment
- Daily Exit Slips
- Standards Mastery Assessment (i-Ready)



## **Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.1 Lessons 1-18

### **2.DL.B.4 Graphing Favorite Colors:**

- Provide each student with a small piece of paper and ask them to write down their favorite color.
- Collect the papers and create a tally chart on the board, recording the number of students who chose each color.
- Guide students to transfer the data from the tally chart to a bar graph, with each color represented by a different-colored bar.
- Discuss the results and ask questions about the data, such as "Which color was chosen the most/least?" and "How many students chose blue compared to red?"

### **2.DL.B.4 Picture Graph Puzzles:**

- Create picture graph puzzles where students have to interpret the data represented in the graphs.
- Provide each student with a set of picture graph puzzles that include simple images (e.g., apples, stars, or animals).
- Instruct students to count the number of each image in the graph and record their findings.
- Encourage students to compare the quantities of different images and answer questions related to the data represented in the graphs.

### **2.OA.A.1 & 2.OA.B.2 Tape Diagram Problem Solving:**

- Present students with word problems involving addition and subtraction.
- Introduce tape diagrams as a visual representation to help students understand and solve the problems.
- Guide students to create tape diagrams to represent the quantities and relationships described in the word problems.
- Encourage students to use the tape diagrams to find the sum or difference and explain their reasoning.

### **2.DL.A.1 & 2.DL.A.2 Data Collection and Analysis Centers:**

- Set up data collection and analysis centers around the classroom.
- Provide students with various materials for collecting data, such as tally sheets, picture graphs, and bar graphs.
- Instruct students to collect data on topics of interest, such as favorite foods, pets, or hobbies, and represent the data using different graphing methods.
- Facilitate discussions where students compare and analyze the data collected by different groups.

### **2. NBT.A.2, 2. & 2. NBT.B.5 Number Talks with Addition and Subtraction:**

- Conduct daily Number Talks sessions focusing on addition and subtraction within 20.
- Present students with mental math problems involving addition or subtraction and encourage them to share and discuss their strategies.
- Scaffold the sessions to gradually increase the complexity of the problems, incorporating strategies such as decomposition and compensation.

**2..DL.A.1 Math Games with Data:**

- Create math games that incorporate data collection and analysis.
- For example, students could play a game where they roll dice to collect data on the number of times each number is rolled, then represent the data using a bar graph.
- Encourage students to interpret the data and make predictions based on the results of the game.

***RESOURCES***

**Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 1
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

**Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks

## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Adding and Subtracting within 100

**Target Course/Grade Level:** Mathematics/2nd Grade

**Unit Summary:** Students add and subtract within 100 using strategies based on place value, the properties of operations, and the relationship between addition and subtraction. Students begin by using any strategy to find the value of sums and differences that do not involve composing or decomposing a ten. They are then introduced to base-ten blocks as a tool to represent addition and subtraction and move towards strategies that involve composing and decomposing tens. Students develop their understanding of grouping by place value, and begin to subtract one- and two-digit numbers from two-digit numbers by decomposing a ten as needed. They apply properties of operations and practice reasoning flexibly as they arrange numbers to facilitate addition or subtraction. For example, students compare Mai and Lin’s methods for finding the value of  $63-18$ . At the end of the unit, students apply their knowledge of addition and subtraction within 100 to solve one- and two-step story problems of all types, with unknowns in all positions. To support the students in reasoning about place value when adding and subtracting, students may choose to use connecting cubes, base-ten blocks, tape diagrams, and other representations learned in earlier units and grades.

Throughout the unit, the warm-up activities help students to transition from addition and subtraction strategies such as counting on and counting back, towards strategies that focus on understanding the value of the digits. The Number Talks in this unit begin with subtraction, as they learn to subtract 2 two-digit numbers, subtract a multiple of ten, and decompose a ten to subtract. The Number Talks then shift to addition with 3 or more addends, which helps students get ready for two-step story problems.

**Approximate Length of Unit:** 4 weeks

## *LEARNING TARGETS*

### **NJ Student Learning Standards:**

#### **Mathematics:**

**2.DL.B.4** 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 problems using information presented in a bar graph

**2.NBT.A.2** Count within 1000; skip-count by 5s, 10s, and 100s.

**2.NBT.B.5** With and 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.NBT.B.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.

**2.NBT.B.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

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

**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.

**2.OA.B.2** Fluently add and subtract within 20 using mental strategies.

### **Interdisciplinary Connections and Standards:**

#### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

#### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

#### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

#### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

#### **Unit Understandings:**

- Students add and subtract within 100 using strategies based on place value and properties of operations, and the relationship between addition and subtraction.
- They then use what they know to solve story problems.

#### **Unit Essential Questions:**

- How can we use addition and subtraction to solve problems in everyday situations?
- How do addition and subtraction relate to each other? Can we use one to help us solve problems involving the other?

**Knowledge and Skills:**

*Students will know...*

- Place value.
- How to use place value understanding and properties of operations to add and subtract.
- How to represent and solve problems involving addition and subtraction.

*Students will be able to...*

- Add and subtract within 100 in a way that makes sense to them without composing or decomposing a ten.
- Solve problems within 100.
- Describe their methods using place value understanding.
- Find the unknown addend in equations within 100.
- Describe their methods using place value understanding.
- Solve story problems involving addition and subtraction within 100 without composing or decomposing a ten.
- Add and subtract within 100.
- Subtract a one-digit number from a two-digit number in a way that makes sense to them.
- Describe how methods of subtraction are the same and different when subtracting a one-digit number from a two-digit number.
- Subtract a two-digit number from a two-digit number in a way that makes sense to them.
- Describe how methods of subtraction are the same and different when subtracting a one-digit number from a two-digit number.
- Add and subtract within 100 using strategies based on place value, including composing and decomposing a ten, and the properties of operations.
- Add and subtract within 100.
- Represent and solve story problems within 50 in a way that makes sense to them.
- Make sense of diagrams that represent story problems.
- Solve one-step story problems within 100.
- Make sense of equations that represent story problems.
- Represent and solve one-step story problems within 100.
- Use diagrams or equations to represent and solve one- and two-step story problems within 100.
- Add and subtract within 100.
- Interpret diagrams.
- Solve one-step story problems.

***EVIDENCE OF LEARNING***

**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Cool Downs
- Section Checkpoints
- Illustrative Math: End of Unit 2.2 Common Assessment
- Daily Exit Slips
- Standards Mastery Assessment (i-Ready)

## Learning Activities:

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.2 Lessons 1-17

### 2.NBT.A.2 & 2.NBT.B.5 Building Fluency:

- **Number Line Race:** Divide students into teams. Provide each team with a number line (0-100) and addition/subtraction flashcards. Students take turns drawing a card, solving the problem, and placing a marker on the corresponding number on the number line. The first team to reach a designated finish line wins.
- **"Beat the Clock" Addition/Subtraction:** Set a timer for a short period (1-2 minutes). Students work independently or in pairs to solve as many addition or subtraction problems within 100 written on a worksheet or flashcards before the timer runs out. Repeat with different sets of problems to improve speed and accuracy.
- **"Roll and Add/Subtract":** Provide students with dice (one or two depending on the difficulty level) and addition/subtraction worksheets with problems. Students roll the dice, add/subtract the numbers rolled to the starting number provided on the worksheet, and continue rolling and calculating until they reach a designated ending number.

### 2.OA.A.1 2.NBT.B.6 Real-World Applications:

- **"Shopping Spree" Challenge:** Set up a pretend store with various items priced within 100 "play money" units. Students work in pairs to create a shopping list with a budget (e.g., 50 units). They practice adding item prices to stay within their budget and subtracting the cost of each purchased item to calculate their remaining money.
- **"Classroom Makeover" Math:** Divide the class into groups and assign each group a classroom area (desks, shelves, etc.) Provide students with grid paper and a ruler. They measure the length and width of their assigned area and use addition to calculate the perimeter. This can be followed by subtraction problems to determine how much material (e.g., decorative border) is needed based on the perimeter.
- **"Travel Time" Word Problems:** Present word problems involving addition or subtraction related to travel time (e.g., a trip takes 2 hours, they stop for lunch for 30 minutes, how long is the remaining travel time?). Students can use manipulatives like clocks or act out scenarios to visualize and solve the problems.

### 2.NBT. B.8. & 2.NBT.B.9 Kinesthetic and Collaborative Activities:

- **"Number Line Jump":** Draw a large number line (0-100) on the floor with hopscotch-like squares for each number. Call out addition or subtraction problems, and students jump the corresponding distance on the number line to land on the answer. This is a fun way to practice calculations while moving around.
- **"Flashcard Relay":** Divide students into teams and line them up. Scatter addition/subtraction flashcards around the playing area. The first player from each team runs to a card, solves the problem, and runs back to tag the next teammate. The team that finishes first wins.
- **"Build It Up" with Place Value Blocks:** Provide students with addition or subtraction problems within 100 and place value blocks (ones, tens). Students work together to build the starting number using the blocks and then manipulate the blocks to represent the addition or subtraction, visually demonstrating the calculation process.

## *RESOURCES*

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 2
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks

## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Measuring Length

**Target Course/Grade Level:** Mathematics/2nd Grade

**Unit Summary:** This unit introduces students to standard units of lengths in the metric and customary systems. Students learn about standard units of length: centimeters, meter, inches, and feet. They examine how different measuring tools represent length units, learn how to use the tools, and gain experience in measuring and estimating the lengths of objects. Along the way, students notice that the length of the same object can be described with different measurements and relate this to differences in the size of the unit used to measure. Throughout the unit, students solve one- and two-step story problems involving addition and subtraction of lengths. To make sense of and solve these problems, they use previously learned strategies for adding and subtracting within 100, including strategies based on place value. To close the unit, students learn that line plots can be used to represent numerical data. They create and interpret line plots that show measurement data and use them to answer questions about the data. Students relate the structure of a line plot to the tools they used to measure lengths. This prepares students for the work in the next unit, where they interpret numbers on the number line as lengths from 0. The number line is an essential representation that will be used in future grades and throughout students' mathematical experiences. Throughout the unit, the warm-up activities help students strengthen their conceptual understanding of numbers and develop fluency. Building from the place value understanding developed in the prior unit, students have an opportunity to add and subtract by adding a ten, counting on, and counting back. They can also use strategies that involve adding and subtracting by place value and decomposing a ten.

**Approximate Length of Unit:** 4 Weeks

## *LEARNING TARGETS*

### **NJ Student Learning Standards:**

#### **Mathematics:**

**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.NBT.A.2** Count within 1000; skip-count by 5s, 10s, and 100s.

**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.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.

**2.OA.B.2** With accuracy and efficiency, add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

### **Interdisciplinary Connections and Standards:**

#### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

#### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

#### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

#### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

#### **Unit Understandings:**

- Students measure and estimate lengths in standard units and solve measurement story problems within 100.

**Unit Essential Questions:**

- How can we use tools like rulers to measure the length of objects accurately?
- How do we compare the lengths of different objects using vocabulary like "longer than," "shorter than," or "the same length as"?
- How can estimating the length of an object help us before we measure it with a ruler?
- Why are there different units of measurement for length (e.g., centimeters, inches)?
- How can we use our understanding of measuring length to solve real-world problems (e.g., designing a model house, measuring the growth of a plant)?

**Knowledge and Skills:**

*Students will know...*

- How to measure and estimate lengths in standard units.
- How to relate addition and subtraction to length.

*Students will be able to...*

- Measure length in centimeters and meters.
- Represent and solve one-step story problems within 100.
- Measure length in feet and inches.
- Represent and solve one- and two-step story problems within 100
- Represent numerical data on a line plot.

<b>EVIDENCE OF LEARNING</b>
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**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Cool Downs
- Section Checkpoints
- Illustrative Math: End of Unit 2.3 Common Assessment
- Daily Exit Slips
- Standards Mastery Assessment (i-Ready)

**Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.3 Lessons 1-18

### 2.M.A.1 Building Understanding of Measurement Tools:

- **"Mystery Measurement"**: Blindfold students one at a time and provide them with various objects. They use their hands to estimate the length and then use a ruler to measure the actual length. This activity helps them understand the limitations of estimation and the accuracy of using rulers.
- **"Ruler Scavenger Hunt"**: Hide rulers of different lengths around the classroom. Students work in pairs to find the rulers and then order them from shortest to longest. This reinforces their understanding of scale on rulers and how to compare lengths.
- **"Ruler Olympics"**: Divide students into teams and provide them with different objects and rulers marked in different units (e.g., centimeters, inches). Each team measures their assigned objects and records the results. The team with the most accurate measurements wins. This activity promotes teamwork and reinforces using rulers correctly.

### 2.M.A.3 Practicing Measurement and Comparison:

- **"Length Relay Race"**: Set up a relay race where students take turns measuring objects placed at designated stations on the playing field. The first team to correctly measure all their assigned objects wins. This adds a fun element to practicing measurement skills.
- **"Measure Me" Partner Activity**: Students work in pairs. One student holds various objects (e.g., book, pencil) while the other measures their length and records the results. Then they switch roles. This promotes collaboration and reinforces using rulers accurately.
- **"Mystery Bag Challenge"**: Fill different bags with objects of varying lengths. Students take turns reaching into a bag without seeing inside and estimate the length of the object they feel. Then, they take out the object and measure its actual length. This activity encourages estimation and reinforces using rulers to verify their predictions.

### 2.M.B.5 Real-World Applications:

- **"Classroom Measurement Hunt"**: Students work in pairs to find different objects in the classroom and measure their lengths. They can create a chart or table recording their findings (object name, length). This connects measuring length to their surrounding environment.
- **"Design Your Dream Room"**: Provide students with grid paper and rulers. They design their dream room layout, measuring and labeling the dimensions of furniture and other elements. This activity integrates measurement with creativity and problem-solving.
- **"Plant Growth Tracking"**: Students choose plants to observe in the classroom. They use rulers to measure the initial height of their plants and record the measurements. Over time, they continue measuring and recording the growth, creating a growth chart. This activity connects measuring length with science concepts (plant growth).

## ***RESOURCES***

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 3
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks

## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Addition and Subtraction on the Number Line

**Target Course/Grade Level:** Mathematics/2nd Grade

**Unit Summary:** In this unit, students are introduced to the number line, an essential representation that will be used throughout students' K–12 mathematical experience. They learn to use the number line to represent whole numbers, sums, and differences. They see that the tick marks and numbers on the number line are like those on a ruler: both show equally spaced numbers that represent lengths from 0. Students use this understanding of structure to locate and compare numbers on the number line, as well as to estimate numbers represented by points on the number line. Students then learn conventions for representing addition and subtraction on the number line: using arrows pointing to the right for adding and arrows pointing to the left for subtracting. Students also use the number line to represent addition and subtraction methods discussed in Number Talks, such as counting on, counting back by place, and decomposing a number to get to a ten. The reasoning here deepens students' understanding of the relationship between addition and subtraction. Throughout the unit, students engage in warm-up activities that support student fluency in operations within 100. The Number Talks in this section focus on subtraction using place value strategies, including subtracting tens from tens and ones from ones, and decomposing a ten.

**Approximate Length of Unit:** 4 Weeks

## *LEARNING TARGETS*

### **NJ Student Learning Standards:**

#### **Mathematics:**

**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.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.

**2.NBT.A.2** Count within 1000; skip-count by 5s, 10s, and 100s.

**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

## **Interdisciplinary Connections and Standards:**

### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

### **Unit Understandings:**

- Students learn about the structure of a number line and use it to represent numbers within 100. They also relate addition and subtraction to length and represent the operations on the number line,

### **Unit Essential Questions:**

- How can we use a number line to represent addition and subtraction problems?
- What does moving to the right on the number line mean in terms of addition, and what does moving to the left mean in terms of subtraction?
- How can we use jumps on the number line to solve addition and subtraction problems?
- How does the number line help us compare quantities and find the difference between two numbers?
- How can we use addition and subtraction on the number line to solve everyday problems?
- Why is it important to be able to visualize addition and subtraction on a number line?
- How can using a number line help us estimate sums and differences?
- Can we use addition on the number line to solve subtraction problems, and vice versa?
- How can we use the number line to check our answers for addition and subtraction problems?
- Are there different ways to solve the same addition or subtraction problem on the number line?

**Knowledge and Skills:**

*Students will know...*

- How to represent and solve problems involving addition and subtraction.
- How to add and subtract within 20.
- How to work with equal groups of objects to gain foundations for multiplication.

*Students will be able to...*

- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.
- Locate and compare numbers on a number line.
- Represent sums and differences on a number line.

<b><i>EVIDENCE OF LEARNING</i></b>
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**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Cool Downs
- Section Checkpoints
- Illustrative Math: End of Unit 2.4 Common Assessment
- Daily Exit Slips
- Standards Mastery Assessment (i-Ready)

**Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.4 Lessons 1-15

**2.M.B. Building Understanding of the Number Line:**

- **"Number Line Hop"**: Draw a large number line on the floor with hopscotch-like squares for each number. Call out addition or subtraction problems, and students hop the corresponding distance on the number line to land on the answer. This kinesthetic activity helps visualize movement on the number line.
- **"Number Line Matching Game"**: Create cards with addition or subtraction problems and separate cards with corresponding jumps on a number line (marked with arrows). Students match the problem cards with the correct jump cards, reinforcing the connection between calculations and the visual representation.
- **"Number Line Mystery Bags"**: Fill different bags with objects of varying lengths. Students take turns reaching into a bag without seeing inside and estimate the length of the object. Then, they take out the object, measure its actual length with a ruler, and place a marker on the corresponding spot

on a blank number line. This activity combines estimation with using the number line for measurement.

### **2.NBT.B.5 Practicing Addition and Subtraction:**

- **"Number Line Race"**: Divide students into teams. Provide each team with a number line and addition/subtraction flashcards. Students take turns drawing a card, solving the problem on the number line (marking jumps), and the first team to reach a designated finish line wins. This adds a competitive element to practicing calculations.
- **"Number Line Climb"**: Project a large number line on the board. Students take turns rolling dice, adding/subtracting the rolled numbers, and moving a marker up or down the number line based on the operation. The first player to reach a designated endpoint wins. This gamifies addition and subtraction practice.
- **"Number Line Puzzles"**: Create puzzles with addition or subtraction problems on one side and a corresponding number line with missing jumps on the other side. Students solve the problem and fill in the missing jumps on the number line, reinforcing problem-solving and visual representation.

### **2.OA.A.1 Applying Skills to Real-World Problems:**

- **"Number Line Grocery Shopping"**: Provide students with a shopping list and prices for different items (written on cards). They use addition on the number line to calculate the total cost of their groceries, simulating real-world addition scenarios.
- **"Number Line Treasure Hunt"**: Hide clues around the classroom with addition or subtraction problems on them. Students solve the problems, use the answer to find the next clue's location on a pre-drawn classroom map (marked with corresponding numbers), and continue until they find the "treasure." This activity integrates math with movement and problem-solving.
- **"Number Line Travel Time"**: Present word problems involving addition or subtraction related to travel time (e.g., a trip takes 2 hours, they stop for lunch for 30 minutes, how long is the remaining travel time?). Students solve the problems using the number line, visualizing the time increments with jumps.



## *RESOURCES*

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 4
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebook

## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Numbers to 1,000

**Target Course/Grade Level:** Mathematics/2nd Grade

**Unit Summary:**

In this unit, students extend their knowledge of the units in the base-ten system to include hundreds. They learn that a hundred is a unit made up of 10 tens, and three-digit numbers are formed using units of hundreds, tens, and ones. To make sense of numbers in different ways and to build flexibility in reasoning with them, students work with a variety of representations: base-ten blocks, base-ten diagrams or drawings, number lines, expressions, and equations. At the start of the unit, students express a quantity in terms of the number of units represented by base-ten blocks (3 hundreds, 14 tens, 22 ones). They practice composing larger units from smaller units and representing the value using the fewest number of each unit (4 hundreds, 6 tens, 2 ones). They connect the number of units to three-digit numerals (462). Next, students make sense of three-digit numbers on the number line. Here, they get a sense of the relative distance of whole numbers within 1,000 from zero. Students learn to count to 1,000 by skip-counting on a number line by 10 and 100. They also locate, compare, and order three-digit numbers on a number line. Throughout the unit, the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 are referred to as multiples of 100 for simplicity. The same is true for multiples of 10. “Multiple” is not a word that students are expected to understand or use in grade 2. Students can describe the numbers as some number of tens or hundreds, such as “20 tens” or “3 hundreds.” The warm-up activities enable students to connect what they know about counting and numbers to concepts they are learning in the unit. Choral Count, How Many Do You See? and Estimation Exploration routines are used to support student understanding of the sequential order of numbers and place value as they consider three-digit numbers. The Number Talk activities focus on adding by place value and adding and subtracting multiples of 10, building on skills developed when representing addition and subtraction on the number line. The True or False activities allow students to connect equations to expanded form and use place value understanding to compare values.

**Approximate Length of Unit:** 3 Weeks

## *LEARNING TARGETS*

**NJ Student Learning Standards:**

**Mathematics:**

**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. 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.NBT.A.2** Count within 1000; skip-count by 5s, 10s, and 100s.

**2.NBT.A.3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

**2.NBT.A.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.

**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.NBT.B.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

**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.

### **Interdisciplinary Connections and Standards:**

#### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

#### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

#### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data..

#### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

#### **Unit Understandings:**

- Students extend place value understanding to three-digit numbers.

**Unit Essential Questions:**

- How can we group numbers by ones, tens, and hundreds to understand their value?
- How does the position of a digit in a number affect its value (ones, tens, hundreds)?
- How can we compare and order numbers to 1,000 using place value?
- How can we write numbers in different ways (standard form, expanded form, word form) using place value?
- How can we estimate quantities to get a good idea of how many things there are (up to 1,000)?
- How can we skip count by different numbers (e.g., by 10s, 100s) to efficiently count large quantities?
- How can we round numbers to the nearest ten or hundred to make calculations easier?
- How do numbers help us represent quantities in the real world (e.g., measuring length, counting objects)?
- Where do we encounter numbers to 1,000 in our daily lives (e.g., money, time, distances)?
- How can we use numbers to 1,000 to solve problems in everyday situations?
- How can understanding numbers help us make sense of the world around us?

**Knowledge and Skills:**

*Students will know...*

- How to represent and solve problems involving addition and subtraction.
- How to add and subtract within 20.
- How to work with equal groups of objects to gain foundations for multiplication.
- How to understand place value.
- How to use place value understanding and properties of operations to add and subtract.

*Students will be able to...*

- Read, write, and represent three-digit numbers using base-ten numerals and expanded form.
- Use place value understanding to compose and decompose three-digit numbers
- Compare and order three-digit numbers using place value understanding and the relative position of numbers on a number line.
- Represent whole numbers up to 1,000 as lengths from 0 on a number line.

<b><i>EVIDENCE OF LEARNING</i></b>
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**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Cool Downs
- Section Checkpoints
- Illustrative Math: End of Unit 2.5 Common Assessment
- Daily Exit Slips
- Standards Mastery Assessment (i-Ready)

## Learning Activities:

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.5 Lessons 1-14

### 2.NBT. A. 1 Understanding Place Value:

- **"Place Value Pockets"**: Create construction paper pockets labeled "ones," "tens," and "hundreds." Students manipulate place value blocks (or manipulatives like beans) to represent different numbers by placing them in the corresponding pockets. This kinesthetic activity helps visualize place value concepts.
- **"Number Puzzles"**: Cut out number cards with digits separated by place value (ones, tens, hundreds). Students work in pairs to reassemble the cards into complete numbers, reinforcing their understanding of digit order and place value.
- **"Number Charades"**: Students take turns acting out a specific number (within 1,000) using place value clues. For example, they might tap their foot once (ones digit), clap twice (tens digit), and jump three times (hundreds digit). Their classmates guess the number based on the place value cues. This activity adds a fun element to learning place value.

### 2.NBT. B. 5 & 2.NBT.A. 2 Developing Number Sense:

- **"Number Line Race"**: Draw a large number line on the floor or use a pre-made number line mat. Students take turns rolling dice, adding the numbers rolled, and jumping the corresponding distance on the number line. The first student to reach a designated number wins. This gamifies practicing addition and estimation (judging jump distances).
- **"Estimation Jars"**: Fill different jars with various objects (e.g., paperclips, buttons). Students estimate the number of objects in each jar and then count them to check their estimations. This activity strengthens estimation skills and reinforces counting to 1,000.
- **"Skip Counting Challenge"**: Divide the class into teams. Call out a starting number and a skip counting pattern (e.g., by 10s, by 100s). The first team member to call out the next correct number in the sequence scores a point for their team. This activity promotes skip counting fluency and reinforces number patterns.

### 2. M.B.6 Connecting Numbers to Everyday Life:

- **"Number Scavenger Hunt"**: Hide clues around the classroom with numbers to 1,000 written on them (e.g., on objects, doors). Students search for the clues, read the numbers, and estimate their distance from a designated starting point (using hundreds or thousands for larger distances). This activity integrates number recognition with estimation and movement.
- **"Number Museum"**: Students bring in objects from home with price tags or measurements labeled in numbers. They create a mini-museum exhibit, presenting their objects and explaining how the numbers relate to the object's value or size (connecting numbers to money and measurement).
- **"Number Line Time Travel"**: Create a large number line on the classroom wall with historical dates marked at various points (e.g., invention of the telephone - 1876). Students take turns placing themselves on the number line according to different historical events they research, discussing the order and relative time periods (connecting numbers to historical timelines).

## ***RESOURCES***

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit .5
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks

## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Geometry, Time, and Money

**Target Course/Grade Level:** Mathematics/Grade 2

**Unit Summary:**

In this unit, students transition from place value and numbers to geometry, time, and money. Students distinguished between defining and non-defining attributes of shapes, including triangles, rectangles, trapezoids, and circles. Here, they continue to look at attributes of a variety of shapes and see that shapes can be identified by the number of sides and vertices (corners). Students then study three-dimensional (solid) shapes, and identify the two-dimensional (flat) shapes that make up the faces of these solid shapes.

Next, students look at ways to partition shapes and create equal shares. They extend their knowledge of halves and fourths (or quarters) from grade 1 to now include thirds. Students compose larger shapes from smaller equal-size shapes and partition shapes into two, three, and four equal pieces.

As they develop the language of fractions, students also recognize that a whole can be described as 2 halves, 3 thirds, or 4 fourths, and that equal-size pieces of the same whole need not have the same shape.

Later, students use their understanding of halves and fourths (or quarters) to tell time. In grade 1, they learned to tell time to the half hour. Here, they relate a quarter of a circle to the features of an analog clock. They use “quarter past” and “quarter till” to describe time, and skip-count to tell time in 5-minute intervals. They also learn to associate the notations “a.m.” and “p.m.” with their daily activities.

To continue to build fluency with addition and subtraction within 100, students conclude the unit with a money context. They skip-count, count on from the greatest value, and group like coins, and then add or subtract to find the value of a set of coins. Students also solve one- and two-step story problems involving sets of dollars and different coins, and use the symbols \$ and ¢.

**Approximate Length of Unit:** 5 weeks

## *LEARNING TARGETS*

**NJ Student Learning Standards:**

**Mathematics:**

**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.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.C.7** Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
- 2.M.C.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
- 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.
- 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. Understand the following as special cases:
- 100 can be thought of as a bundle of ten tens — called a “hundred.”
  - 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.NBT.A.2** Count within 1000; skip-count 5s, 10s, and 100s.
- 2.NBT.A.3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
- 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.NBT.B.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.
- 2.NBT.B.8** Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

### **Interdisciplinary Connections and Standards:**

#### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

#### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

#### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.



**Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

**Unit Understandings:**

- Students identify shapes by the number of sides and vertices
- Students will be able to tell time to the hour and minute
- Students will be able to solve one and two step problems involving dollars and coins.

**Unit Essential Questions:**

- How can you determine the number of angles or faces a shape has, and how does this information help you identify and classify different types of polygons or polyhedra?
- What are the specific characteristics that define triangles, quadrilaterals, pentagons, hexagons, and cubes?
- How can you use these characteristics to accurately draw and identify these shapes?
- How do you select the appropriate measuring tool?
- What steps should you follow to ensure accurate and consistent measurements when using tools like rulers and measuring tapes?
- How do you read and write the time accurately from both analog and digital clocks?
- How do you determine the total amount of money given different combinations of dollar bills, quarters, dimes, nickels, and pennies, and how do you represent this total using the \$ and ¢ symbols?
- What strategies can you use to solve word problems involving money?

**Knowledge and Skills:**

*Students will know...*

- How to identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
- How to recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.

*Students will be able to...*

- Partition rectangles and circles into halves, thirds and fourths and name the pieces.
- Recognize 2 halves, 3 thirds, and 4 fourths as one whole.
- Understand that equal pieces do not need to be the same shape.
- Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m
- Find the value of a group of bills and coins.
- Use addition and subtraction within 100 to solve one- and two step word problems.

## EVIDENCE OF LEARNING

### Assessment:

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Warm-ups
- Cool-downs
- Section Checkpoints
- Illustrative Math End-of-Unit 2.6 Assessment
- Daily Exit Slips
- Standards Mastery Assessment (iReady)

### Learning Activities:

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.6 Lessons 1-22

#### 2.G.A.1 Shape Detective

- Provide students with images of various shapes (both polygons and polyhedra). Each image should be partially obscured or incomplete. Students will use their knowledge of shape attributes to identify and label the shapes based on the number of sides, angles, and faces.

#### 2.M.A.1 Measuring Scavenger Hunt

- Provide students with various measuring tools. Students will measure and label different objects around the classroom.

#### 2.M.C.7 Time Treasure Hunt

- Place time treasure hunt clues around the classroom with a specific time and written in either analog or digital format. Students will record the times they find and write the matching times in both formats.

#### 2.M.C.8 Coin Quest

- Provide students with play money. Students will solve word problems involving calculating money and making change using the provided play money.

## ***RESOURCES***

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 6
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks

## UNIT OVERVIEW

**Content Area:** Mathematics

**Unit Title:** Adding and Subtracting within 1,000

**Target Course/Grade Level:** Mathematics/Grade 2

**Unit Summary:**

In this unit, students add and subtract within 1,000, with and without composing and decomposing a base-ten unit.

Previously, students added and subtracted within 100 using methods such as counting on, counting back, and composing or decomposing a ten. Here, they apply the methods they know and their understanding of place value and three-digit numbers to find sums and differences within 1,000.

Initially, students add and subtract without composing or decomposing a ten or hundred. Instead, they rely on methods based on the relationship between addition and subtraction and the properties of operations. They make sense of sums and differences using counting sequences, number relationships, and representations (number line, base-ten blocks, base-ten diagrams, and equations).

As the unit progresses, students work with numbers that prompt them to compose and decompose one or more units, eliciting strategies based on place value. When adding and subtracting by place, students first compose or decompose only a ten, then either a ten or a hundred, and finally both a ten and a hundred. They also make sense of and connect different ways to represent place value strategies. For example, students make sense of a written method for subtracting 145 from 582 by connecting it to a base-ten diagram and their experiences with base-ten blocks.

**Approximate Length of Unit:** 4 weeks

## LEARNING TARGETS

**NJ Student Learning Standards:**

**Mathematics:**

**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. 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.NBT.A.2** Count within 1000; skip-count 5s, 10s, and 100s.

**2.NBT.A.3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

**2.NBT.A.4.1** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using  $>$ ,

=, and < symbols to record the results of comparisons.

**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.NBT.B.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.

**2.NBT.B.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.

**2.NBT.B.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

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

**2.DL.B.4** 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 problems[1] using information presented in a bar graph

### **Interdisciplinary Connections and Standards:**

#### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

#### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

#### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

#### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

**Unit Understandings:**

- Students use place value, understanding the relationship between addition and subtraction, and properties of operations to add and subtract within 1,000.

**Unit Essential Questions:**

- How can you use different strategies to add and subtract numbers within 1000?
- Why is it important to know addition and subtraction facts fluently?
- How can we check our answers to see if they are reasonable?
- What strategies can we use to solve word problems involving addition and subtraction?
- How do we decide whether to add or subtract in a word problem?
- What does each digit in a two-digit number represent?
- How does understanding place value help in solving math problems?
- What are the different ways to classify shapes?
- Why is it important to have standard units of measurement?
- How do mathematicians approach solving new problems?

**Knowledge and Skills:**

*Students will know...*

- How to add and subtract numbers within 1,000 without composition or decomposition, and use strategies based on the relationship between addition and subtraction and the properties of operations.

*Students will be able to...*

- Add numbers within 1,00 using strategies based on place value understanding including composing a ten or hundred.
- Subtract numbers within 1,000 using strategies based on place value understanding, including decomposing a ten or hundred.
- Make sense of a written method for subtracting three digit numbers from three digit numbers by connecting it to a base ten diagram.

## ***EVIDENCE OF LEARNING***

**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Warm-ups
- Cool-downs
- Section Checkpoints
- Illustrative Math End-of-Unit 2.7 Assessment
- Daily Exit Slips
- Standards Mastery Assessment (iReady)

**Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.7 Lessons 1-18

**2. NBT.B.A Place Value Picnic**

- Provide each group a set of addition and subtraction problem cards with three-digit numbers. Students will use base ten blocks to model each problem. They will represent the numbers with hundreds, tens, and ones blocks and perform the addition or subtraction by physically combining or removing blocks. Students will record their calculations by drawing the blocks used and writing the resulting number.

**2.DL.B.4 Graphing Fun Fair**

- Provide each student or each group a piece of paper and stickers or small pictures. Students will create a picture graph to represent the data. Each picture or sticker will represent one unit. Students should label each category (Candy, Balloons, Ribbons, Toys) and draw a key to show what each picture represents (e.g., one sticker = 1 item).

**2.NBT.A.1 Hundreds, Tens, and Ones Party**

- Provide students with a deck of cards with three-digit numbers. Using base ten blocks, students will build the number on their place value mat. Students should count and place the correct number of blocks in each section of their mat and then write the number in standard form.

**2.NBT.A.2 Skip Counting Treasure Hunt**

- Set up stations around the classroom. Each station should have a skip-counting challenge related to 5s, 10s, or 100s. At each station, students will complete a challenge (e.g., “Skip-count by 10s from 50 to 150”) and then receive a sticker or token for successfully completing the challenge. They will move to the next station as they solve each problem.

## ***RESOURCES***

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 7
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks



## *UNIT OVERVIEW*

**Content Area:** Mathematics

**Unit Title:** Equal Groups

**Target Course/Grade Level:** Mathematics/2nd Grade

**Unit Summary:**

In this unit, students develop an understanding of equal groups, building on their experiences with skip-counting and with finding the sums of equal addends. The work here serves as the foundation for multiplication and division in grade 3 and beyond.

Students begin by analyzing even and odd numbers of objects. They learn that any even number can be split into 2 equal groups or into groups of 2, with no objects left over. Students use visual patterns to identify whether numbers of objects are even or odd.

Next, students learn about rectangular arrays. They describe arrays using mathematical terms (rows and columns). Students see the total number of objects as a sum of the objects in each row and as a sum of the objects in each column, which they express by writing equations with equal addends. They also recognize that there are many ways of seeing the equal groups in an array.

**Approximate Length of Unit:** 3 weeks

## *LEARNING TARGETS*

**NJ Student Learning Standards:**

**Mathematics:**

**2.NBT.A.2** Count within 1000; skip-count 5s, 10s, and 100s.

**2.NBT.B.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.

**2.NBT.B.8** Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.

**2.OA.B.2** With accuracy and efficiency, add and subtract within 20 using mental strategies.

**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.

**2.G.A.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

## **Interdisciplinary Connections and Standards:**

### **English Language Arts:**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

Constructing explanations and designing solutions

Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data..

### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

### **Unit Understandings:**

- Students work with equal groups of objects to gain foundations for multiplication.

### **Unit Essential Questions:**

- Why is it important to know addition and subtraction facts fluently?
- How can you use concrete models, drawings, and place value strategies to add and subtract three-digit numbers?
- How can you determine whether a group of up to 20 objects has an odd or even number of members?
- How can you use addition to determine the total number of objects in a rectangular array with up to 5 rows and 5 columns?
- How can we check our answers to see if they are reasonable?
- How can we represent parts of a whole using fractions?
- What are some real-life examples where we use fractions?
- How can we compare fractions to understand their size?
- How can we use mathematical vocabulary to explain our thinking?

- How can you partition a rectangle into rows and columns of same-size squares to find the total number of squares?

**Knowledge and Skills:**

*Students will know...*

- How to determine whether a group of objects (up to 20) has an odd or even number of members
- How to write an equation to express an even number as a sum of two equal addends.

*Students will be able to...*

- Determine whether a group of objects (up to 20) has an odd or even number of members.
- Write an equation to express an even number as a sum of two equal addends
- Find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns using addition.
- Partition rectangles into rows and columns of equal-size squares, and count to find the total number of squares.
- Represent the total number of objects in an array as a sum of equal addends.

**EVIDENCE OF LEARNING**

**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Warm-ups
- Cool-downs
- Section Checkpoints
- Illustrative Math End-of-Unit 2.8 Assessment Daily Exit Slips
- Standards Mastery Assessment (iReady)

**Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.8 Lessons 1-15

**2.G.A.2 Square City**

- Provide students with grid paper and a ruler. Students will draw various rectangles of different sizes. Students will partition each rectangle into rows and columns of same-size squares (1x1) using the ruler and markers or small square stickers. They will count the total number of squares in each rectangle and write the number on their worksheet.

### **2.OA.C.4 Array Different Adventure**

- Provide students with counters to create their own rectangular arrays on grid paper. They can create arrays with up to 5 rows and 5 columns. For each array they create, students will count the total number of objects in the array by adding the number of objects in each row. Then they will write an equation to express the total as a sum of equal addends. For example, for a 4x3 array, the total can be expressed as  $3 + 3 + 3 + 3$ .

### **2.OA.C.3 Odd and Even Number Detective**

- Provide each group of students with a set of small objects up to 20. Each group will also get a deck of cards numbered from 1-20. Each card will represent a different quantity. Students will draw a number card from the deck, which tells them how many objects to use. They will then group the objects and determine if the number is odd or even by pairing them. For even numbers, they should be able to pair all objects without any leftovers. For odd numbers, they will have one leftover object.

### **2.OA.B.2 Mental Math Magic**

- Provide students with a deck of Magic Math Cards that have simple addition and subtraction problems. Students will take turns drawing the cards and solving the problems. They will say the answer aloud.

## ***RESOURCES***

### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 8
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks

## UNIT OVERVIEW

**Content Area:** Mathematics

**Unit Title:** Putting It All Together

**Target Course/Grade Level:** Mathematics/Grade 2

**Unit Summary:**

In this unit, students revisit major work and fluency goals of the grade, applying their learning from the year. Students will have the opportunity to solidify their fluency with addition and subtraction within 20. Next, students apply methods they used with smaller numbers to add and subtract numbers within 100. They also revisit numbers within 1,000: composing and decomposing three-digit numbers in different ways, and using methods based on place value to find their sums and differences. Finally, students interpret, solve, and write story problems involving numbers within 100, which further develop their fluency with addition and subtraction of two-digit numbers. They work with all problem types with the unknown in all positions.

**Approximate Length of Unit:** 3 weeks

## LEARNING TARGETS

**NJ Student Learning Standards:**

**Mathematics:**

- 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
- 2.OA.B.2** With accuracy and efficiency, add and subtract within 20 using mental strategies.
- 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. Understand the following as special cases:
- 100 can be thought of as a bundle of ten tens — called a “hundred.”
  - 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.NBT.A.3** Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
- 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.NBT.B.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.
- 2.NBT.B.9** Explain why addition and subtraction strategies work, using place value and the properties of operations.
- 2.M.A.1.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- 2.M.A.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.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.

### **Interdisciplinary Connections and Standards:**

#### **English Language Arts**

**SL.AS.2.6.** Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification.

**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.

**RI.MF.2.6.** Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text. Students can analyze and interpret images such as bar graphs and pictographs that represent data.

#### **Science & Engineering Practices:**

Asking questions and defining problems

Developing and using models

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Using mathematics and computational thinking

Obtaining, evaluating, and communicating information

#### **Technology:**

**8.1.5.DA.1:** Collect, organize, and display data in order to highlight relationships or support a claim.

**8.1.5.DA.3:** Organize and present collected data visually to communicate insights gained from different views of the data.

**8.1.5.DA.4:** Organize and present climate change data visually to highlight relationships or support a claim.

**8.1.5.DA.5:** Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

#### **Career Readiness, Life Literacies, and Key Skills:**

**9.4.2.CT.1:** Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).

**9.4.2.CT.2:** Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).

**9.4.2.CT.3:** Use a variety of types of thinking to solve problems (e.g., inductive, deductive).

**9.4.2.CI.1:** Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).

**9.4.2.IML.2:** Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).

#### **Unit Understandings:**

- Students understand that they can solidify their understanding of various concepts and skills related to major work of the grade.
- They also continue to work toward fluency goals of the grade.

**Unit Essential Questions:**

- How can you use mental strategies to quickly and accurately solve addition and subtraction problems within 20?
- How can you use different strategies to add and subtract numbers within 100?
- How can we use place value to compare two-digit numbers?
- What are the different ways to classify shapes?
- Why is it important to have standard units of measurement?
- How do you select and use the appropriate tool to accurately measure different objects?
- How can you use addition and subtraction to solve word problems involving measurement?
- How can we collect and organize data?
- How can we use data to answer questions?
- How do mathematicians approach solving new problems?

**Knowledge and Skills:**

*Students will know...*

- How to fluently add and subtract with 20.
- How to apply methods used with smaller numbers to add and subtract within 100.
- How to interpret, solve, and write story problems involving numbers within 100.

*Students will be able to..*

- Fluently add and subtract within 100.
- Add and subtract with 1,000 using strategies based on place value and properties of operations.
- Represent and solve one- and two-step story problems within 100.
- Compose and decompose three digit numbers in different ways.
- Use methods based on place value to find the sums and differences.

## ***EVIDENCE OF LEARNING***

**Assessment:**

*What evidence will be collected and deemed acceptable to show that students truly “understand”?*

- Warm-ups
- Cool-downs
- Section Checkpoints
- Illustrative Math End-of-Unit 2.9 Assessment
- Daily Exit Slips
- Standards Mastery Assessment (iReady)

**Learning Activities:**

*What differentiated learning experiences and instruction will enable all students to achieve the desired results?*

- Online math games/activities
- Centers
- Math Dialogue
- Illustrative Mathematics (IM) 2.9 Lessons 1-13

### **2.DL.B.3 Measurement Line Plot Adventure**

- Divide students into small groups or pairs. Provide each group with a set of objects to measure, a ruler or measuring tape, and line plot templates. Explain that each group will measure the length of several objects to the nearest whole unit and record these measurements on their line plot.

### **2.M.B.5 Lengths in Action**

- Provide each group with a set of Word Problem Cards, drawing paper, markers or crayons, and math journals. Each group selects a Word Problem Card and reads the problem carefully. Students discuss and decide whether to use addition or subtraction to solve the problem. The group will draw a visual representation of their solution.

### **2.M.A.4 Length Difference Detective**

- Provide each group with a set of objects to measure, a ruler or measuring tape, and Length Difference Recording Sheets. Each group selects two objects from the provided set. Students measure the length of each object using the ruler or measuring tape, recording the lengths on their Length Difference Recording Sheets.

### **2.OA.A.1 Word Problem Workshop**

- Students create their own one- and two-step word problems, complete with drawings and equations, and exchange with a partner to solve.

## ***RESOURCES***

#### **Teacher Resources:**

- i-Ready Teacher Toolbox
- Place Value Assessment Tool (PVAT)
- Illustrative Math (IM) Unit 9
- IM Student Work
- IM Blackline Masters
- Online District Approved Digital Resources

#### **Equipment Needed:**

- Manipulatives
- IM Student Workbook
- Student Whiteboards
- Chart Paper
- Dry Erase Markers
- Chromebooks