



West Windsor-Plainsboro Regional School District
Grade 2 Mathematics
Updated August 2023

Math Equity Statement

ALL learners should have access to rigorous, high-level mathematical content in an environment where risk-taking, deep conceptual understanding, and growth mindset are the norm.

Catalyzing Change

Our District strategic goals lay the foundation for teaching and learning from a productive stance.

Catalyzing Change in Early Childhood and Elementary School Mathematics: Initiating Critical Conversations pushes us to consider equitable mathematics practices and move from deficit to productive beliefs (NCTM, 2020). Our goal is to have each student see themselves as doers, knowers, and sense makers of mathematics. Leveraging *Catalyzing Change*, we have three focused areas to understand our work to help each and every student develop a positive math identity and have agency within their learning.

The three areas of focus in our math learning continue to be:

1. *Build a mathematics community* through routines & structures (experience wonder, joy, and beauty in mathematics, while building agency through making conjectures, justifying thinking, and building on one another's ideas)
2. *Deepen mathematical understanding* to develop confident and capable learners through grade level appropriate goals.
3. *Develop strong foundational skills* emphasizing reasoning and sense making to ensure the highest-quality mathematics education for each and every child.

Math Workshop

Math workshop is a model of instruction that allows all students to be engaged in mathematics learning, provide space for reflection, and for all students to realize their abilities as mathematicians. Math workshop model provides the structures for student choice, problem solving, targeted small group instruction, time throughout the year to practice the critical concepts of the grade level (Lempp, 2017).

For students, our classrooms need to be places where they are comfortable taking intellectual risks. In *From Reading to Math*, Sienna (2009) outlines four values to support students in taking risks and creating discourse. The values are:

- Value the thinking process as well as correct answers.
- Value problems for which more than one answer is possible.
- Value inquisitive responses.
- Value tolerance for mistakes. (Sienna, 2009, p. 68).

Math workshop allows for these values to come through creating a supportive, collaborative learning environment for each and every student.

Number Sense Routines

We define a number sense routine as “an engaging, accessible, purposeful routine to begin your math class that promotes a community of positive mathematics and discussion” (Lempp, 2017, pg.146). It is usually done in the first 5-10 minutes of a math class. Number sense routines are the foundation of supporting social-emotional learning in mathematics. These routines invite all learners into the community while building positive math identity and sense making. It is where students begin to see themselves as doers, knowers, and sense-makers of mathematics.

Fluency

Fluency is the ability to apply procedures efficiently, flexibly, and accurately. Fluency is multifaceted and encompasses basic fact fluency, computational fluency and procedural fluency (Bay-Williams & SanGiovanni, 2021, p. 2). Bay-Williams and SanGiovanni (2021) define efficiency, flexibility, and accuracy as:

Efficiency: Solving a procedure in a reasonable amount of time by selecting an appropriate strategy and readily implementing that strategy

Flexibility: Knowing multiple procedures and applying or adapting strategies to solve procedural problems (Baroody & Dowker, 2003; Star, 2005 as cited by Bay-Williams & SanGiovanni, 2021, p.3).

Accuracy: Correctly solving a procedure. (Bay-Williams & SanGiovanni, 2021, p. 3)

Additionally, Jennifer Bay-Williams and John SanGiovanni state, “Because effective instruction of (real) fluency values actions such as selecting, understanding, and evaluating strategies, as well as flexibility and reasonableness, students are able to develop strategic competence and adaptive reasoning. *These competencies positively shape their mathematics identity, while also nurturing their mathematical agency*” (NCTM, Figuring Out Fluency Presentation, New Orleans, 2022).

Grade 2 Big Ideas & Standards

In Grade 2, instructional time should focus on four critical areas: (1) extending understanding of base-ten notation; (2) building fluency with addition and subtraction; (3) using standard units of measure; and (4) describing and analyzing shapes (NJDOE, NJSL-M, 2016).

A complete copy of the 2016 New Jersey Student Learning Standards for Grade 2 Mathematics may be found on the [NJDOE’s New Jersey Student Learning Standards for Mathematics webpage](#).

Unit 1: Fact Fluency to 20	
Content Area: Elementary Mathematics	
Course & Grade Level: Mathematics, Grade 2	
Summary and Rationale	
The beginning of the school year helps us establish our rich learning communities so that students can see themselves as doers, knowers, and sense-makers of mathematics. Students devote time to learning efficient strategies for addition and subtraction to 20, preparing them for future application when working with larger numbers. We will model with the number rack, bead strings, and the number line. We will build our confidence as we situate the operations in real-world contexts.	
Recommended Pacing	
20 days	
New Jersey Student Learning Standards for Mathematics	
Standard: 2.OA.A Represent and solve problems involving addition and subtraction.	
CPI #	Cumulative Progress Indicator (CPI)
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.
Standard: 2.OA.B Add and subtract within 20.	
CPI #	Cumulative Progress Indicator (CPI)
2.OA.B.2	Fluently add and subtract within 20 using mental strategies. ² By end of Grade 2, know from memory all sums of two one-digit numbers.
Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.	
CPI #	Cumulative Progress Indicator (CPI)
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.
Standard: 2.NBT.A Understand place value.	
CPI #	Cumulative Progress Indicator (CPI)
2.NBT.A.2	Count within 1000; skip-count by 5s, 10s, and 100s.
Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.	
CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)

2.MD.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.
Standard: 2.MD.C Work with time and money.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?
Standard: 2.MD.D Represent and interpret data.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.D. 10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
Standard: 2.G.A Reason with shapes and their attributes.	
CPI #	Cumulative Progress Indicator (CPI)
2.G.A.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2.G.A.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
2.MP.2	Reason abstractly and quantitatively.
3.MP.3	Construct viable arguments and critique the reasoning of others.
2.MP.4	Model with mathematics.
2.MP.5	Use appropriate tools strategically.
2.MP.6	Attend to precision.
2.MP.7	Look for and make use of structure.
2.MP.8	Look for and express regularity in repeated reasoning.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
CPI #	Cumulative Progress Indicator (CPI)
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.

Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.4	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
6.1.2.Civics PD.2	Establish a process for how individuals can effectively work together to make decisions.
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Processes and Rules Rules and people who have authority are necessary to keep everyone safe, resolve conflicts, and treat people fairly.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PR.3	Analyze classroom rules and routines and describe how they are designed to benefit the common good.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● We can use different operations when solving for an unknown. ● Computation involves taking apart and combining numbers using a variety of strategies. ● Flexible methods of computation involve grouping numbers in a variety of ways including regrouping. ● We use place value to help us solve number sentences. ● We try out strategies to find the most efficient and accurate method and represent the strategy using numbers and symbols. ● Numbers can be composed and decomposed to solve problems. 	
Unit Essential Questions	
<ul style="list-style-type: none"> ● How do we solve for the unknown number? ● How does knowing our facts help us to solve math problems? ● How does the position of a digit in a number affect its value? ● How do we use different strategies to help us add and subtract? 	
Objectives	

We are learning to/that:

- Use a variety of strategies to solve basic facts with fluency (efficiency, flexibility, accuracy, and automaticity)
- Use the appropriate vocabulary for operations of addition and subtraction (plus, equals, sum, addends, difference, minuends, minus, compare, equals, greater than, less than, etc.)
- Represent math problems in numbers, pictures, and words
- Ten ones equals one ten
- Our number system is based on groups of 10.
- Solve simple put-together (addition), take-apart (subtraction), and comparison problems.
- Use the opposite relationship between addition and subtraction to solve problems
- Use a variety of strategies and models to represent word problems
- Use addition and subtraction strategies to solve one and two step word problems within 20
- Develop a variety of methods (pictures, words, numbers, manipulatives) to explain/show how to solve addition and subtraction problems
- Use manipulatives to solve addition and subtraction problems.

Evidence of Learning**Assessment**

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

 Formative Assessment Summative Assessment Alternative Assessment Benchmark**Resources****Foundational Text:**

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

- Exemplars, *Problem Solving for the 21st Century*
- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
- *Math in Practice: Teaching Second Grade Math* by Allison Peet, Susan O'Connell, & John SanGiovanni
- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
- *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* by Jo Boaler
- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

WW-P Accommodations and Assessment (Reference Tool and Glossary)

Unit 2: Place Value and Measurement

Content Area: Elementary Mathematics

Course & Grade Level: Mathematics, Grade 2

Summary and Rationale

Students set off on a journey with Jack and his Beanstalk to explore base ten concepts and models within 1,000. The mathematical adventure begins with measuring cube trains using self-created tools. By measuring lengths in 5s and 10s, students are able to make the transition to jumps on a number line. The models and representations explored in this unit allow students to develop conceptual understanding of measurement as they also learn about the base ten number system.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: 2.OA.A Represent and solve problems involving addition and subtraction.

CPI #	Cumulative Progress Indicator (CPI)
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.

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

CPI #	Cumulative Progress Indicator (CPI)
2.OA.B.2	Fluently add and subtract within 20 using mental strategies. ² By end of Grade 2, know from memory all sums of two one-digit numbers.

Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.A Understand place value.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently 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.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.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.MD.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.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
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2.MP.7	Look for and make use of structure.
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New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
CPI #	Cumulative Progress Indicator (CPI)
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.

Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.4	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● The position of a digit in a number determines its value. ● The groupings of ones, tens and hundreds for a given number can be taken apart in different ways. ● Estimation is a strategy for getting as close as possible to an exact answer. ● Mathematical relationships that have numbers or objects that repeat can be described and generalized in predictable ways. ● Mathematical equations represent relationships among quantities. ● Specific tools measure specific attributes. 	
Unit Essential Questions	
<ul style="list-style-type: none"> ● How does the position of a digit in a number affect its value? ● In what different ways can numbers be grouped? ● What are strategies to make a reasonable estimate? ● What is a pattern? ● How do we use symbols to represent mathematical ideas? ● What units and tools measure the different attributes? ● Why are standard units of measurement used? ● How does estimation help us with measurement? 	
Objectives	
We are learning to/that:	
<ul style="list-style-type: none"> ● Construct, identify and compare sets of numbers to 100 using manipulatives to show quantity 	

- Identify, read and write the number of ones, tens and hundreds in a two or three digit number and determine the value of each digit
- Use groups of tens to estimate quantities to 100
- Numbers can be represented in different ways. (expanded form, word form, standard form, with manipulatives, etc)
- Compare and order one, two and three digit numbers applying place value concepts and using the symbols $<$, $>$, $=$
- Show a given whole number in equivalent ways (63, $60 + 3$, $57 + 6$)
- Identify, describe and extend number patterns.
- Mentally add and subtract by 10s and 100s.
- Compare lengths to determine the difference in length
- Measure using nonstandard units.
- Estimate and measure length.

Evidence of Learning

Assessment

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

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- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
- *Math in Practice: Teaching Second Grade Math* by Allison Peet, Susan O'Connell, & John SanGiovanni
- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
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- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

WW-P Accommodations and Assessment (Reference Tool and Glossary)

Unit 3: Addition and Subtraction within 100

Content Area: Elementary Mathematics

Course & Grade Level: Mathematics, Grade 2

Summary and Rationale

Unit 3 is designed to promote building a solid sense of our number system. Students will skip and jump through this unit on their number lines. Making “skip jumps” of 5s and 10s allows students to use a number line as a computational tool with greater efficiency. Students’ counting skills will be called upon to utilize the connection between counting and calculating. They will try out different strategies for creating and solving multi-digit addition and subtraction story problems. The unit concludes with activities around data collection and analysis.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: 2.OA.A Represent and solve problems involving addition and subtraction.

CPI #	Cumulative Progress Indicator (CPI)
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. 1

Standard: 2.OA.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.OA.B.2	Fluently add and subtract within 20 using mental strategies. ² By end of Grade 2, know from memory all sums of two one-digit numbers.

Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.A Understand place value.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.B B. Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently 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.9	Explain why addition and subtraction strategies work, using place value and the properties of operations.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.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.MD.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.
Standard: 2.MD.C Work with time and money.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
Standard: 2.MD.D Represent and interpret data.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems ⁴ using information presented in a bar graph.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
2.MP.2	Reason abstractly and quantitatively.
2.MP.3	Construct viable arguments and critique the reasoning of others.
2.MP.4	Model with mathematics.
2.MP.5	Use appropriate tools strategically.
2.MP.6	Attend to precision.
2.MP.7	Look for and make use of structure.
2.MP.8	Look for and express regularity in repeated reasoning.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	

CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.
Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RL.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.6	Identify the main purpose of a text, including what the author wants to answer, explain, or describe.
RI.2.7	Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● We can use different operations when solving for an unknown. ● Computation involves taking apart and combining numbers using a variety of strategies. ● Flexible methods of computation involve grouping numbers in a variety of ways including regrouping. ● We use place value to help us solve number sentences. ● We try out strategies to find the most efficient and accurate method and represent the strategy using numbers and symbols. ● Numbers can be composed and decomposed to solve problems. ● Each coin has a value which can be combined with others to make a new value. 	
Unit Essential Questions	
<ul style="list-style-type: none"> ● How do we solve for the unknown number? ● How does knowing our facts help us to solve math problems? ● How does place value affect the value of a number? ● How do we use different strategies to help us add and subtract? 	
Objectives	
We are learning to/that: <ul style="list-style-type: none"> ● Use a variety of strategies to solve addition and subtraction problems (efficiently, flexibly, accurately) ● Use the appropriate vocabulary for operations of addition and subtraction (plus, equals, sum, addends, difference, minuends, minus, compare, equals, greater than, less than, etc.) ● Represent math problems in numbers, pictures, and words ● Solve various types of addition and subtraction problems (result unknown, start unknown, change unknown) 	

- 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
- Use addition and subtraction strategies to solve one and two step word problems within 100
- Develop a variety of methods (pictures, words, numbers, manipulatives) to explain/show how to solve addition and subtraction problems
- Use manipulatives and models to solve addition and subtraction problems
- Skip-count by 5s, 10s and 100s within 1000 (orally and with tools: including coins)
- Solve equations with multiple addends and/or differences
- Collect, record, organize, and interpret data in various ways

Evidence of Learning

Assessment

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

- Exemplars, *Problem Solving for the 21st Century*
- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
- *Math in Practice: Teaching Second Grade Math* by Allison Peet, Susan O'Connell, & John SanGiovanni
- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
- *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* by Jo Boaler
- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

[WW-P Accommodations and Assessment \(Reference Tool and Glossary\)](#)

Unit 4: Measurement	
Content Area: Elementary Mathematics	
Course & Grade Level: Mathematics, Grade 2	
Summary and Rationale	
Students return to the land of giants and beanstalks to explore measurement from multiple entry points in a giant's world. Students investigate conversions using the nonstandard units- <i>inchworms</i> , <i>footworms</i> , and <i>yardworms</i> along with multiple opportunities to make conversions between standard units of measure-inches, feet, and yards. By measuring objects with different units of measure, students realize that the smaller the unit, the greater the number of units needed to measure an object's length. Ratios and proportional reasoning are concepts explored through visual representations.	
Recommended Pacing	
20 days	
New Jersey Student Learning Standards for Mathematics	
Standard: 2.OA.A Represent and solve problems involving addition and subtraction.	
CPI #	Cumulative Progress Indicator (CPI)
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.
Standard: 2.OA.B Use place value understanding and properties of operations to add and subtract.	
CPI #	Cumulative Progress Indicator (CPI)
2.OA.B.2	Fluently add and subtract within 20 using mental strategies. ² By the end of Grade 2, know from memory all sums of two one-digit numbers.
Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.	
CPI #	Cumulative Progress Indicator (CPI)
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.
Standard: 2.NBT.A Understand place value.	
CPI #	Cumulative Progress Indicator (CPI)
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.
Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.	
CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently 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.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.

2.MD.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.MD.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.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.MD.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.
Standard: 2.MD.C Work with time and money.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
Standard: 2.MD.C Work with time and money.	
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
2.MP.2	Reason abstractly and quantitatively.
2.MP.3	Construct viable arguments and critique the reasoning of others.
2.MP.4	Model with mathematics.
2.MP.5	Use appropriate tools strategically.
2.MP.6	Attend to precision.
2.MP.7	Look for and make use of structure.
2.MP.8	Look for and express regularity in repeated reasoning.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
CPI #	Cumulative Progress Indicator (CPI)
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.

8.1.2.DA.4	Make predictions based on data using charts or graphs.
Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.4	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● It is important to use standard units of measurement. ● Measurements can be compared using different units. ● A measurement must be represented by a number and a unit. 	
Unit Essential Questions	
<ul style="list-style-type: none"> ● How can we accurately represent the information we collect? ● What units and tools measure the different attributes? ● Why are standard units of measurement used? ● Why are units used in measuring? ● How does estimation help us with measurement? 	
Objectives	
We are learning to/that:	
<ul style="list-style-type: none"> ● Compare and determine the difference of lengths ● Compare two different measurements taken with different measurement units ● Identify and describe measurable attributes ● Choose and use measurement tools appropriately ● Estimate and measure in nonstandard and standard units (half inches, inches, feet, yards) ● Identify, describe and extend number patterns ● Extend a growing pattern ● Represent repeated addition with an array 	

- Write a repeated addition sentence to represent an array
- Solve various problems involving money

Evidence of Learning

Assessment

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

- Exemplars, *Problem Solving for the 21st Century*
- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
- *Math in Practice: Teaching Second Grade Math* by Allison Peet, Susan O'Connell, & John SanGiovanni
- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
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- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

[WW-P Accommodations and Assessment](#) (Reference Tool and Glossary)

Unit 5: Place Value to 1,000

Content Area: Elementary Mathematics

Course & Grade Level: Mathematics, Grade 2

Summary and Rationale

This unit provides a deep dive into place value. Students will investigate bundling objects into groups of 5, 10, and 100 using concrete models such as popsicle sticks, clips, cubes, coins, and base ten area pieces. Using models helps students conceptualize the value of digits in bigger numbers. Coins provide a helpful tool for students when students skip counting and solving number patterns.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: 2.OA.A Represent and solve problems involving addition and subtraction.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.OA.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.OA.B.2	Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.

Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.A Understand place value.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently 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.8	Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.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.MD.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.MD.B.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
Standard: 2.MD.C Work with time and money.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
Standard: 2.MD.D Represent and interpret data	
CPI#	Cumulative Progress Indicator (CPI)
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems ⁴ using information presented in a bar graph.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.1 Personal Financial Literacy: Money comes in different values, forms, and uses.	
CPI #	Cumulative Progress Indicator (CPI)
9.1.2.FI.1	Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
CPI #	Cumulative Progress Indicator (CPI)
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.
Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	

CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RL.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.6	Identify the main purpose of a text, including what the author wants to answer, explain, or describe.
RI.2.7	Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● The position of a digit in a number determines its value. ● The groupings of ones, tens, hundreds and thousands for a given number can be taken apart in different ways. ● Estimation is a strategy for getting as close as possible to an exact answer. ● Mathematical equations represent relationships among quantities. ● Each coin has a value which can be combined with others to make a new value. ● Patterns are all around us. 	
Unit Essential Questions	
<ul style="list-style-type: none"> ● How does the position of a digit in a number affect its value? ● In what different ways can numbers be grouped? ● How do we use symbols to represent mathematical ideas? ● How do we determine the value of a coin or set of coins? ● How is money related to place value? ● How do we use patterns to make generalizations? 	
Objectives	
We are learning to/that: <ul style="list-style-type: none"> ● Construct, identify and compare sets of numbers to 1,000 using manipulatives to show quantity ● Identify, read and write the number of ones, tens and hundreds in a two or three digit number and determine the value of each digit ● Use groups of tens and to estimate quantities to 100 and 1,000 ● Compare and order one, two and three digit numbers applying place value concepts and using the symbols <, >, = ● Show a given whole number in equivalent ways (63, 57 + 6, expanded form) ● Count with in 1000, starting and ending with any given pair of numbers ● Skip count by 5s, 10s, and 100s up to 1000 ● Mentally add and subtract 10 and/or 100 from any given number (on and off the decade) ● Identify, describe and extend number and picture patterns. 	

- Extend a growing pattern
- Estimate and measure using nonstandard units
- Recognize, name and identify the value of all the coins (penny, nickel, dime and quarter)
- Count coin combinations up to one dollar
- Count money starting with coins of greatest value
- Make fair trades with all coins
- Compare collections of coins and dollars (<, >, =)
- Show the value using the least amount of coins
- Use decimal points and dollar signs, or cents signs, when writing money amounts

Evidence of Learning

Assessment

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

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Instructional & Professional Resources:

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- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

WW-P Accommodations and Assessment (Reference Tool and Glossary)

Unit 6: Geometry

Content Area: Elementary Mathematics

Course & Grade Level: Mathematics, Grade 2

Summary and Rationale

Students will investigate two-dimensional shapes, fractions (halves and fourths), congruence, symmetry, and transformations. They will use tools to learn about shapes and how they can be manipulated (created, taken apart, partitioned) in more sophisticated ways than when studied in grade 1. Students are introduced to tessellations (tiling a plane) and finding areas of shapes by counting. They will use a large amount of vocabulary to help to understand geometry. Vocabulary development is critical as this will be something they carry with them into higher-level mathematics and science.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: 2.OA.A Represent and solve problems involving addition and subtraction.

CPI #	Cumulative Progress Indicator (CPI)
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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.
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Standard: 2.OA.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
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2.OA.B.2	Fluently add and subtract within 20 using mental strategies. ² By end of Grade 2, know from memory all sums of two one-digit numbers.
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Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.

CPI #	Cumulative Progress Indicator (CPI)
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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.
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Standard: 2.NBT.A Understand place value.

CPI #	Cumulative Progress Indicator (CPI)
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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.
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2.NBT.A.3	Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.
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Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
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2.NBT.B.5	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
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2.NBT.B.6	Add up to four two-digit numbers using strategies based on place value and properties of operations.
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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.
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Standard: 2.MD.C Work with time and money.

CPI #	Cumulative Progress Indicator (CPI)
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2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems ⁴ using information presented in a bar graph.
Standard: 2.G.A Reason with shapes and their attributes.	
CPI #	Cumulative Progress Indicator (CPI)
2.G.A.1	Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. ⁵ Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.
2.G.A.2	Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
2.MP.2	Reason abstractly and quantitatively.
2.MP.3	Construct viable arguments and critique the reasoning of others.
2.MP.4	Model with mathematics.
2.MP.5	Use appropriate tools strategically.
2.MP.6	Attend to precision.
2.MP.7	Look for and make use of structure.
2.MP.8	Look for and express regularity in repeated reasoning.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
9.4.2.TL.7	Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.
Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	

CPI #	Cumulative Progress Indicator (CPI)
RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.4	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Social Studies

Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.

CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.

Instructional Focus

Unit Enduring Understandings

- Geometric shapes can be named and classified by their attributes.
- Fractions are related to real-life situations.
- A whole can be divided into equal sized parts in different ways.
- A fraction describes the division of a whole into equal parts.

Unit Essential Questions

- What are the attributes of geometric figures?
- What are ways shapes can be sorted?
- How are plane shapes different from solids?
- How can shapes be composed and decomposed to form new shapes?
- How can fractions be used in everyday life?
- How can parts of a whole be represented?
- How can fractions be modeled and compared?

Objectives

We are learning to/that:

- Identify, describe, and compare plane and solid geometric shapes (circle, triangle, square, rectangle, quadrilaterals, trapezoid, rhombus, pentagon, hexagon, sphere, pyramid, cube, and rectangular prism)
- Classify solid figures according to such attributes as the shape of faces, edges and vertices (including cubes, rectangular prisms, spheres, cylinders, cones, and pyramids)
- Compose and decompose shapes to form other shapes
- Identify and model symmetry with concrete materials and drawings
- Identify and use flips, slides, and turns
- Draw or create a representation of shapes in various ways
- Represent repeated addition with an array
- Write a repeated addition sentence to represent an array
- An array can be used to determine perimeter and area
- Use concrete models and pictures to represent fractions
- Develop an understanding of how numbers are used to represent fractions

- Partition a whole into two, three, or four equal parts and describe the parts using the words; halves, thirds, half of, a third of, etc.
- Describe a whole as two halves, three thirds, or four fourths
- Compare fractional parts using concrete models
- Demonstrate an understanding that equal parts of identical wholes do not have to be the same shape
- Use vocabulary such as: part, whole, equal parts, fair shares, one out of ____, numerator, denominator

Evidence of Learning

Assessment

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

- Exemplars, *Problem Solving for the 21st Century*
- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
- *Math in Practice: Teaching Second Grade Math* by Allison Peet, Susan O'Connell, & John SanGiovanni
- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
- *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* by Jo Boaler
- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

[WW-P Accommodations and Assessment \(Reference Tool and Glossary\)](#)

Unit 7: Measurement, Fractions, and Multi-Digit Computation

Content Area: Elementary Mathematics

Course & Grade Level: Mathematics, Grade 2

Summary and Rationale

Get ready to wear your etymology hat! This unit tackles metric measurement, fractions, and multi-digit addition and subtraction using the context of ants. Students will build upon their knowledge of customary measurement from Unit 4 to the metric system. Nonstandard units make a comeback in the form of “ant rulers.” Students spend time estimating and measuring the length of objects, big and small. They will explore fractions and division in the context of sharing at a picnic. Students will pose and solve story problems with addition, subtraction, and money, still using the context of ants.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: 2.OA.A Represent and solve problems involving addition and subtraction.

CPI #	Cumulative Progress Indicator (CPI)
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. 1

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

CPI #	Cumulative Progress Indicator (CPI)
2.OA.B.2	Fluently add and subtract within 20 using mental strategies.2 By end of Grade 2, know from memory all sums of two one-digit numbers.

Standard: 2.NBT.A Understand place value.

CPI #	Cumulative Progress Indicator (CPI)
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

Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently 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.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.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.MD.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.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.
Standard: 2.MD.C Work with time and money.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
Standard: 2.MD.D Represent and interpret data.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems using information presented in a bar graph.
Standard: 2.G.A Reason with shapes and their attributes.	
CPI #	Cumulative Progress Indicator (CPI)
2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
2.MP.2	Reason abstractly and quantitatively.
2.MP.3	Construct viable arguments and critique the reasoning of others.
2.MP.4	Model with mathematics.
2.MP.5	Use appropriate tools strategically.
2.MP.6	Attend to precision.
2.MP.7	Look for and make use of structure.
2.MP.8	Look for and express regularity in repeated reasoning.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
CPI #	Cumulative Progress Indicator (CPI)
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
9.4.2.TL.7	Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.
Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.4.	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
RI.2.10.	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone's voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● A whole can be divided into equal sized parts in different ways. ● Computation involves taking apart and combining numbers using a variety of strategies. ● Flexible methods of computation involve grouping numbers in a variety of ways including regrouping. ● Problems can be solved using manipulatives and models. ● Numbers can be composed and decomposed to solve problems. ● We make change because the exact amount of money does not need to be used to make a purchase. ● Data can be gathered and displayed in an organized and concise way. 	
Unit Essential Questions	

- What strategies, models and tools can be used to solve multi-digit equations/word problems?
- How can parts of a whole be represented?
- How can fractions be modeled and compared?
- How can we accurately represent, compare and analyze the information we collect?
- How do we use symbols to represent mathematical ideas?
- How do we determine the amount of change needed?

Objectives

We are learning to/that:

- Use concrete models and pictures to represent and compare fractions
- Develop an understanding of how numbers are used to represent fractions
- Partition a shape into equal parts and describe them as having wholes, halves, thirds, and fourths.
- Use vocabulary such as: part, whole, equal parts, fair shares, one out of ____, numerator, denominator
- Compare and determine the difference of lengths
- Compare two different measurements taken with different measurement units
- Choose and use measurement tools appropriately
- Estimate and measure in standard units (meters, centimeters)
- Solve money story problems involving dollars, quarters, dimes, nickels, and pennies; use \$ and ¢ signs appropriately
- Use a variety of strategies, manipulatives and models to solve addition and subtraction problems (efficiently, flexibly, accurately)
- Use the appropriate vocabulary for operations of addition and subtraction (plus, equals, sum, addends, difference, minuends, minus, compare, equals, greater than, less than, etc.)
- Represent math problems in numbers, pictures, and words
- Solve various types of addition and subtraction problems (result unknown, start unknown, change unknown)
- Use addition and subtraction strategies to solve one and two step word problems within 1000

Evidence of Learning

Assessment

The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

- Exemplars, *Problem Solving for the 21st Century*
- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
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- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
- *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* by Jo Boaler
- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

WW-P Accommodations and Assessment (Reference Tool and Glossary)

Unit 8: Measurement, Data, and Multi-Digit Computation

Content Area: Elementary Mathematics

Course & Grade Level: Mathematics, Grade 2

Summary and Rationale

To wrap up our second grade math learning, students draw upon their learning throughout the year. First, students will review their work with place value and three-digit computation. Then they work collaboratively to use all they have learned to create and test a marble track. They will collect and analyze the data and make adjustments as needed.

Recommended Pacing

20 days

New Jersey Student Learning Standards for Mathematics

Standard: 2.OA.A Represent and solve problems involving addition and subtraction.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.OA.C Work with equal groups of objects to gain foundations for multiplication.

CPI #	Cumulative Progress Indicator (CPI)
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.

Standard: 2.NBT.A Understand place value.

CPI #	Cumulative Progress Indicator (CPI)
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 <ul style="list-style-type: none"> 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.

Standard: 2.NBT.B Use place value understanding and properties of operations to add and subtract.

CPI #	Cumulative Progress Indicator (CPI)
2.NBT.B.5	Fluently 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.
Standard: 2.MD.A Measure and estimate lengths in standard units.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.A.1	Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
2.MD.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.MD.A.3	Estimate lengths using units of inches, feet, centimeters, and meters.
2.MD.A.4	Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.
Standard: 2.MD.B Relate addition and subtraction to length.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.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.MD.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.
Standard: 2.MD.C Work with time and money	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.C.7	Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.
2.MD.C.8	Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
Standard: 2.MD.D Represent and interpret data.	
CPI #	Cumulative Progress Indicator (CPI)
2.MD.D.9	Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.
2.MD.D.10	Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put together, take-apart, and compare problems ⁴ using information presented in a bar graph.
Standard: 2.G.A Reason with shapes and their attributes.	
CPI #	Cumulative Progress Indicator (CPI)
2.G.A.3	Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.
Standard: Standards for Mathematical Practice	
CPI #	Cumulative Progress Indicator (CPI)
2.MP.1	Make sense of problems and persevere in solving them.
2.MP.2	Reason abstractly and quantitatively.
3.MP.3	Construct viable arguments and critique the reasoning of others.
2.MP.4	Model with mathematics.
2.MP.5	Use appropriate tools strategically.
2.MP.6	Attend to precision.
2.MP.7	Look for and make use of structure.

2.MP.8	Look for and express regularity in repeated reasoning.
New Jersey Student Learning Standards for Career Readiness, Life Literacies, and Key Skills	
Standard: 9.4 Critical Thinking & Problem Solving: Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.	
CPI #	Cumulative Progress Indicator (CPI)
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).
Standard: 9.4 Life Literacies and Key Skills: Technology Literacy: Digital tools have a purpose.	
CPI #	Cumulative Progress Indicator (CPI)
9.4.2.TL.6	Illustrate and communicate ideas and stories using multiple digital tools (e.g., SL.2.5.).
9.4.2.TL.7	Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts
New Jersey Student Learning Standards for Computer Science and Design Thinking	
Standard: 8.1 Computer Science: Data & Analysis: Data can be used to make predictions about the world.	
CPI #	Cumulative Progress Indicator (CPI)
8.1.2.DA.3	Identify and describe patterns in data visualizations.
8.1.2.DA.4	Make predictions based on data using charts or graphs.
Standard: 8.2 Design Thinking: Engineering Design Engineering design is a creative process for meeting human needs or wants that can result in multiple solutions.	
CPI #	Cumulative Progress Indicator (CPI)
8.2.2.ED.2	Collaborate to solve a simple problem, or to illustrate how to build a product using the design process.
Interdisciplinary Standards	
English Language Arts	
CPI #	Cumulative Progress Indicator (CPI)
RI.2.1	Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text.
RI.2.4	Determine the meaning of words and phrases in a text relevant to a grade 2 topic or subject area.
RI.2.10	Read and comprehend informational texts, including history/social studies, science, and technical texts, at grade level text complexity proficiently with scaffolding as needed.
W.2.8	Recall information from experiences or gather information from provided sources to answer a question.
NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
NJSLSA.SL5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
Science: Matter and Its Interactions	
CPI #	Cumulative Progress Indicator (CPI)
2-PS1-1	Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
2-PS1-2	Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
Science: Engineering Design	
CPI #	Cumulative Progress Indicator (CPI)
K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

K-2-ETS1-3	Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Social Studies	
Standard: 6.1 U.S. History: America in the World: Civics, Government, and Human Rights: Participation and Deliberation When all members of the group are given the opportunity to participate in the decision making process, everyone’s voice is heard.	
CPI #	Cumulative Progress Indicator (CPI)
6.1.2.Civics PD.1	Engage in discussions effectively by asking questions, considering facts, listening to the ideas of others, and sharing opinions.
Instructional Focus	
Unit Enduring Understandings	
<ul style="list-style-type: none"> ● Flexible methods of computation involve grouping numbers in a variety of ways including regrouping. ● Problems can be solved using manipulatives and models. ● Numbers can be composed and decomposed to solve problems. ● Data can be gathered and displayed in an organized and concise way. 	
Unit Essential Questions	
<ul style="list-style-type: none"> ● What strategies, models and tools can be used to solve multi-digit equations/word problems? ● How can we accurately represent, compare and analyze the information we collect? 	
Objectives	
<p>We are learning to/that:</p> <ul style="list-style-type: none"> ● Construct, identify and compare sets of numbers up to 9,999 using manipulatives to show quantity ● Identify, read and write the number of ones, tens, and hundreds in a two or three digit number and determine the value of each digit ● Use groups of tens and to estimate quantities to 100 and 1,000 ● Compare and order one, two and three digit numbers applying place value concepts and using the symbols (<, >, =) ● Compare and determine the difference of lengths ● Compare two different measurements taken with different measurement units ● Choose and use measurement tools appropriately ● Estimate and measure in standard units (meters, centimeters) ● Use a variety of strategies, manipulatives and models to solve addition and subtraction problems (efficiently, flexibly, accurately) ● Use the appropriate vocabulary for operations of addition and subtraction (plus, equals, sum, addends, difference, minuends, minus, compare, equals, greater than, less than, etc.) ● Represent math problems in numbers, pictures, and words ● Solve various types of addition and subtraction problems (result unknown, start unknown, change unknown) ● Use addition and subtraction strategies to solve one and two step word problems within 1000 ● Gather, organize, display and interpret data through a survey or observation ● Interpret data from tally charts, glyphs, Venn diagrams, pictographs, bar graphs, and line plots in terms of most, least, more, less and equal ● Understand and interpret different types of scales ● Show measurement data by making a line plot, where the horizontal scale is in whole number units ● Create a line plot using a template which requires the title and the data collected to be shown Identify, describe and extend number patterns 	
Evidence of Learning	
Assessment	
The assessment plan may include teacher-designed formative and summative assessments, district common assessments, self-assessments, and analysis of standardized benchmark and interim assessment data. During each	

common, formative, and summative assessment, teachers will provide [accommodations](#) and alternative assessment opportunities that adhere to 504 and IEP requirements. Alternative Assessments are individualized for the needs of all students. Throughout the unit, students will be engaged in activities that involve finding patterns, making generalizations, drawing conclusions, and communicating their ideas with others. Teachers will have many opportunities to observe students' growth in these areas, as well as with specific math skills and concepts throughout this unit.

Formative Assessment

Summative Assessment

Alternative Assessment

Benchmark

Resources

Foundational Text:

Bridges in Mathematics Grade 2 by The Math Learning Center

Instructional & Professional Resources:

- Exemplars, *Problem Solving for the 21st Century*
- K-5 Math Teaching Resources
- DreamBox Learning (Digital Tool)
- *Math in Practice: Teaching Second Grade Math* by Allison Peet, Susan O'Connell, & John SanGiovanni
- *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp
- *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching* by Jo Boaler
- *Teaching Student Centered Mathematics: Developmentally Appropriate Instruction for Grades PreK-2 (Volume I)* by John A. Van de Walle, Karen S. Karp, LouAnn H. Lovin, & Jennifer M. Bay-Williams

Additional Supports

[WW-P Accommodations and Assessment](#) (Reference Tool and Glossary)

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