

# **Fair Lawn Public Schools**

**Fair Lawn, NJ**

**Grade 2  
Math**

**Adopted August**

**2017**

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Developed August 2011**

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Grade 2 Mathematics is aligned to the Student Learning Standards and will expand upon topics learned in Grade 1 as well as prepare students for Grade 3 Mathematics.

**Grade 2  
Math**

# Fair Lawn School District

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# Grade 2 Math

## I. Course Synopsis

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.

1. Students extend their understanding of the base-ten system. This includes ideas of counting in fives, tens, and multiples of hundreds, tens, and ones, as well as number relationships involving these units, including comparing. Students understand multi-digit numbers (up to 1000) written in base-ten notation, recognizing that the digits in each place represent amounts of thousands, hundreds, tens, or ones (e.g., 853 is 8 hundreds + 5 tens + 3 ones).
2. Students use their understanding of addition to develop fluency with addition and subtraction within 100. They solve problems within 1000 by applying their understanding of models for addition and subtraction, and they develop, discuss, and use efficient, accurate, and generalizable methods to compute sums and differences of whole numbers in base-ten notation, using their understanding of place value and the properties of operations. They select and accurately apply methods that are appropriate for the context and the numbers involved to mentally calculate sums and differences for numbers with only tens or only hundreds.
3. Students recognize the need for standard units of measure (centimeter and inch) and they use rulers and other measurement tools with the understanding that linear measure involves an iteration of units. They recognize that the smaller the unit, the more iterations they need to cover a given length.
4. Students describe and analyze shapes by examining their sides and angles. Students investigate, describe, and reason about decomposing and combining shapes to make other shapes. Through building, drawing, and analyzing two- and three-dimensional shapes, students develop a foundation for understanding area, volume, congruence, similarity, and symmetry in later grades.

## II. Philosophy & Rationale

The mathematics curriculum is completely aligned to the Student Learning Standards for second grade. Second grade content required by the Student Learning Standards focuses on the procedures, concepts, and applications in the following areas:

### Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Add and subtract within 20.
- Work with equal groups of objects to gain foundations for multiplication.

### Number and Operations in Base Ten

- Understand place value.

- Use place value understanding and properties of operations to add and subtract.

#### Measurement and Data

- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

#### Geometry

- Reason with shapes and their attributes.

As the content is taught, the Student Learning Standards mathematical practices are also woven in, helping to develop the attitudes and habits of mind of those who know and enjoy mathematics and use it effectively. The practices include:

- Problem solving
- Multiple representations
- Reasoning
- Mathematical modeling
- Tool use
- Communication

*The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one’s own efficacy).*

#### **MATH.PRACTICE.MP1 - Make sense of problems and persevere in solving them.**

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically

proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

**MATH.PRACTICE.MP2 - Reason abstractly and quantitatively.**

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

**MATH.PRACTICE.MP3 - Construct viable arguments and critique the reasoning of others.**

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

**MATH.PRACTICE.MP4 - Model with mathematics.**

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify

important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

**MATH.PRACTICE.MP5 - Use appropriate tools strategically.**

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

**MATH.PRACTICE.MP6 - Attend to precision.**

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

**MATH.PRACTICE.MP7 - Look for and make use of structure.**

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see  $7 \times 8$  equals the well-remembered  $7 \times 5 + 7 \times 3$ , in preparation for learning about the distributive property. In the expression  $x^2 + 9x + 14$ , older students can see the 14 as  $2 \times 7$  and the 9 as  $2 + 7$ . They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see  $5 - 3(x - y)^2$  as 5 minus a positive number times a

square and use that to realize that its value cannot be more than 5 for any real numbers  $x$  and  $y$ .

**MATH.PRACTICE.MP8 - Look for and express regularity in repeated reasoning.**

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through  $(1, 2)$  with slope 3, middle school students might abstract the equation  $(y - 2)/(x - 1) = 3$ . Noticing the regularity in the way terms cancel when expanding  $(x - 1)(x + 1)$ ,  $(x - 1)(x^2 + x + 1)$ , and  $(x - 1)(x^3 + x^2 + x + 1)$  might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

### III. Scope & Sequence

Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June
1.1- 1.13	1.13 – 2.13	3.1 – 3.11	3.12- 4.10	4.11- 5.9	5.10- 6.6	6.7- 7.7	7.8- 8.9	8.10- 9.7	9.8- 9.12

Grade 2 has 9 instructional units.  
Each unit is completed in approximately 3-5 weeks.

Unit	Name	Weeks	Topics
1	Establishing Routines	Weeks 1-5	<ul style="list-style-type: none"> <li>Number lines</li> <li>Coins</li> <li>Number grids and number scrolls</li> <li>Quick looks routine</li> <li>Equivalent names for numbers</li> <li>Combinations of 10</li> <li>Even and odd number patterns</li> <li>Comparing numbers using <math>&lt;</math>, <math>&gt;</math>, and <math>=</math></li> </ul>
2	Fact Strategies	Weeks 6-9	<ul style="list-style-type: none"> <li>Place Value</li> <li>Number Stories</li> <li>Helper Facts</li> <li>Commutative Property of addition</li> <li>Even and odd numbers</li> <li>Equivalent names for numbers</li> <li>Frames and arrows</li> </ul>
3	More Fact Strategies	Weeks 10-14	<ul style="list-style-type: none"> <li>Developing subtraction strategies</li> <li>Relating addition and subtraction</li> <li>Counting strategies for subtraction</li> <li>“What’s My Rule?”</li> <li>Using 10 as a friendly number</li> </ul>
4	Place Value and Measurement	Weeks 15-18	<ul style="list-style-type: none"> <li>Telling time</li> <li>Place Value</li> <li>Length Measurement</li> </ul>
5	Addition and Subtraction	Weeks 19-23	<ul style="list-style-type: none"> <li>Fact power</li> <li>Money</li> <li>Open number lines</li> <li>Number stories and number models</li> </ul>
6	Whole Number Operations And Number Stories	Weeks 24-28	<ul style="list-style-type: none"> <li>Data displays</li> <li>Number Stories</li> <li>Strategies for addition</li> </ul>
7	Whole Number	Weeks 29-33	<ul style="list-style-type: none"> <li>Addition and subtraction strategies</li> </ul>

	Operations And Measurement and Data		<ul style="list-style-type: none"><li>● Length measurement units and tools</li><li>● Data Displays</li></ul>
<b>8</b>	Geometry and Arrays	Weeks 34-38	<ul style="list-style-type: none"><li>● 2- and 3-dimensional shapes</li><li>● Partitioning rectangles</li><li>● Equal groups and arrays</li></ul>
<b>9</b>	Equal Shares	Weeks 39-43	<ul style="list-style-type: none"><li>● Equal shares</li><li>● Place value and subtraction</li><li>● Money</li><li>● Multiples of 2, 5, and 10</li></ul>

## IV. Unit Descriptions

### Unit 1: Establishing Routines

(Weeks 1 - 5)

#### Enduring Understanding

1. Numbers are all around. When children explore the numbers they see in the world around them, they make sense of quantities and their relationships in problem situations.

#### Essential Question(s)

1. How can I create mathematical representations?
2. How can I use mathematical tools to solve a problem?

#### Learning Objectives

Students will be able to:

1. Explore counts and represent whole numbers as lengths of 0 on a number line
2. Practice partnership principles while solving addition and subtraction number stories number stories and representing whole-number sums and difference on a number line
3. Count tallies and calculate the values of coin combinations
4. Make a class number scroll from 0 to 1.000 using place value strategies
5. Use patterns to solve an open response problem
6. Use addition and subtraction to write equivalent names for numbers
7. Build fact fluency by finding combinations of 10
8. Investigate *my reference book*
9. Explore even and odd numbers using concrete and visual models
10. Skip count on calculators and number grids and look for place-value patterns in their counts
11. Discuss the meaning of  $<$ ,  $>$ ,  $=$  symbols and use the symbols to record comparisons of numbers, money amounts, and addition and subtraction
12. Count by 100s and 10s, find the value of base-10 “building,” use shapes to cover rectangles, and sort dominoes according to the number of dots

#### New Jersey Student Learning Standards

- **2.OA.2** Fluently add and subtract within 20 using mental strategies.
- **2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members.
  - **2.NBT.2** Count within 1000; skip count by 5s, 10s, and 100s.
  - **2.NBT.3** Read and write numbers to 1000 using base ten numbers, number names and expanded form.
    - **2.NBT.4** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using  $>$ ,  $=$ , and  $<$  symbols.
    - **2.NBT.8** Mentally add or subtract 10 or 100 to a given number 100-900.
    - **2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0,1,2.
    - **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using dollar signs and cent symbols appropriately.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal pages
  - d. Writing/Reasoning Prompts
  - e. Explorations: Exploring Base-10 Blocks, Area, and Dominoes
  - f. Open Response and Reengagement Lesson: Number Grid Puzzles
  - g. Unit 1 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
2. English Language Learners
  - a. Use of visual representations such as the vocabulary picture cards, number grid and counters
  - b. Support children's acquisition of descriptive vocabulary by modeling using objects.
  - c. Use concrete examples to show groups of even and odd objects
3. Special Education/504 Students
  - a. Modification of journal pages
  - b. Use of manipulatives counters and number grid, and vocabulary picture cards
  - c. Replacing larger addends with smaller addends
  - d. Use concrete models to show combinations of 10
  - e. Use concrete examples to show fractional parts
4. Gifted and Talented Students
  - a. Enrichment activity cards
  - b. Number scrolls beyond 1,000
  - c. For experience adding multiples of 10, use multiple of 100

### New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

## **Unit 2: Fact Strategies**

**(Weeks 6 - 9)**

### Enduring Understanding

1. To develop strategies for solving addition facts, children first examine addition facts and look closely to discern a pattern or structure.
2. Proficient students notice if calculations are repeated and look for both general methods and for shortcuts.

### Essential Question(s)

1. How can you use place value understanding and properties to add and subtract fluently?
2. What strategies can be used to add and subtract within 20 fluently?

### Learning Objectives

Students will be able to:

1. Explore place value concepts as they play the Exchange Game with money and practice grouping by 10s, using \$1.00, \$10.00 and \$100.00 bills.
2. Write and solve addition number stories,
3. Explore doubles and combinations of ten to build fact fluency.
4. Use a strategy based on place value to add within 20.
5. Use the near-doubles strategy to solve addition facts..
6. Use dominoes to explore the Turn Around Rule for addition.
7. Solve an Open Response problem by writing number stories and models.
8. Explore counting up, odd and even numbers, and shapes
9. Identify even and odd numbers, and write number models to express even and odd numbers and sums.
10. Generate equivalent names for numbers and write them in Name-Collection Boxes.
11. Find many ways to name numbers.
12. Skip-count, add, and subtract to solve frame-and-arrows problems.

### New Jersey Student Learning Standards

- **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
  - **2.OA.2** Fluently add and subtract within 20 using mental strategies.
  - **2.OA.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; right an equation to express an even number as a sum of 2 equal addends.
    - **2.NBT.1** Understand that the three digits of a 3-digit number represent amounts of hundreds, tens, and ones; e.g.,  $706 = 7$  hundreds, 0 tens, and 6 ones.
    - **2.NBT.2** Count within 1000; skip count by 5s, 10s, and 100s.
    - **2.NBT.3** Read and write numbers to 1000 using base ten numbers, number names and expanded form.
    - **2.NBT.5** Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal pages
  - d. Writing/Reasoning Prompts

- e. Explorations: Exploring addition tools, odd and even patterns, and shapes.
  - f. Open Response and Reengagement Lesson: Number Grid Puzzles
  - g. Unit 2 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
  - i. Games: *The Exchange Game, Spinning for Money, Fishing for 10, The Number Grid Game, Two-Fisted Penny Addition, Roll and Record Doubles, Even and Odds, Name that Number*
2. English Language Learners
    - a. Use of visual representations such as the vocabulary picture cards, number grid and counters
    - b. Support children's acquisition of descriptive vocabulary by modeling using objects.
  3. Special Education/504 Students
    - a. Modification of journal pages
    - b. Use of manipulatives counters and number grid, and vocabulary picture cards
    - c. Replacing larger addends with smaller addends
    - d. For experience exchanging coins begin with pennies and nickels and build on
    - e. Provide manipulatives to solve number stories
  4. Gifted and Talented Students
    - a. Enrichment activity cards
    - b. Find combinations of 100 rather than 10
    - c. Further explore number stories by creating their own number stories
    - d. Create two rule frame and arrow problems

#### New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

### **Unit 3: More Fact Strategies**

**(Weeks 10-14)**

#### Enduring Understanding

1. Students, who are mathematically proficient, understand and make use of definitions and previous knowledge in constructing arguments. Students can decide whether the arguments of others make sense.
2. Students communicate clearly with others, and are able to make accurate and efficient calculations.

#### Essential Question(s)

1. How can I construct applicable arguments and critique the mathematical reasoning of others?
2. How can I efficiently and accurately count, measure, and calculate mathematically while clearly explaining my thinking?

### Learning Objectives

Students will be able to

1. Add and subtract within 20 to solve one step word problems.
2. Know doubles and combinations of 10 while being able to apply strategies to solve addition facts.
3. Add within 100 using a number grid, number line, or counters; and understand the relationship between numbers in a fact family.
4. Use number models to add and subtract within 100 when solving “what’s my rule” problems.
5. Explain why addition and subtraction strategies work.
6. Represent whole-number sums and differences within 20 on a number line diagram.
7. Solve problems involving pennies and dimes.
8. Use equivalent square tiles to partition a rectangle into rows and columns.

### New Jersey Student Learning Standards

- **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
  - **2.OA.2** Fluently add and subtract within 20 using mental strategies.
  - **2.NBT.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.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 3-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.9** Explain why addition and subtraction strategies work, using place value and the properties of operations.
  - **2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0,1,2.
  - **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using dollar signs and cent symbols appropriately.
  - **2.G.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal pages

- d. Writing/Reasoning Prompts
  - e. Explorations: Coin stamp booklets, covering a rectangle, and addition/subtraction facts
  - f. Open Response and Re-engagement Lesson: Using addition strategies
  - g. Unit 3 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
  - i. Games: *salute!*, *subtraction top it*, *name that number*, *money exchange game*
2. English language learners.
    - a. Throughout this unit, to support ELLs, visual representations will be used to discuss language that may be difficult. Opportunities for choral counting will be provided.
  3. Special education/504 students.
    - a. Throughout this unit concrete use of tangible manipulatives such as number grids, number lines, counters, and dominoes.
    - b. Small group instruction and modeling will also help to support the learners having difficulty with the concepts.
  4. Gifted and talented students
    - a. Throughout this unit concepts will be extended for gifted learners by incorporating opportunities to explore numbers less than zero, use a calculator as a function machine, and extend their work using multi digit numbers.

#### New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

### **Unit 4: Place Value and Measurement**

**(Weeks 15-18)**

#### Enduring Understanding

1. Students make sense of mathematical problems and persevere in solving them. They understand the approaches of others to solving complex problems and check their answers to problems using a different method.
2. Students use an appropriate level of precision for the problem context. They try to communicate precisely with others by using clear labels, units, and mathematical language.

#### Essential Question(s)

1. How can I make sense of problems and persevere in solving them?
2. How can I understand the strategies to solving complex problems that others use and connect it to my own thinking?
3. How can I explain my mathematical thinking by using clear definitions (labels, units, etc.) in discussions with others and my own reasoning?

#### Learning Objectives

Students will be able to:

1. Tell time to the nearest hour and half hour

2. Tell time to the nearest 5 minutes
3. Tell time using A.M. and P.M.
4. Discuss place value and represent three digit numbers using base ten blocks and expanded form
5. Use place value and expanded form to compare three digit numbers
6. Make sense of a three digit number represented by base ten blocks by making trades or counting
7. Analyze explanations and drawings of a three digit number and revise their work
8. Use base ten blocks to model addition and subtraction of multidigit numbers
9. Measure objects with a foot long foot
10. Identify the inch as a standard unit of length
11. Identify the centimeter as a standard unit of length
12. Match subtraction facts with strategies, measure a path in inches and centimeters, and explore arrays

#### New Jersey Student Learning Standards

- **2.OA.2** Fluently add and subtract within 20 using mental strategies.
- **2.OA.3** Determine whether a group of objects (up to 20) has an odd or even number of members.
  - **2.NBT.1** Understand that the three digits of a three-digit number represent amounts of hundreds, tens, ones.
  - **2.NBT.3** Read and write numbers to 1000 using base ten numbers, number names and expanded form.
  - **2.NBT.4** Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using  $>$ ,  $=$ , and  $<$  symbols.
  - **2.NBT.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 and 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.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
  - **2.MD.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.3** Estimate lengths using units of inches, feet, centimeters, and meters.
  - **2.MD.7** Tell and write time using analog and digital clocks.
  - **2.MD.9** Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal pages
  - d. Writing/Reasoning Prompts
  - e. Explorations: Matching subtraction facts with strategies, measuring a path in inches and centimeters, and exploring arrays
  - f. Open Response and Reengagement Lesson: Represent numbers using base 10 blocks and analyze their explanations and drawings as well as revise their work.
  - g. Unit 4 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
  - i. Group work through games to reinforce unit objectives
2. English Language Learners.
  - a. Throughout this unit to support ELLs visual representations will be used to discuss language that may be difficult such as the “face” and “hands” of the clock, foot long “foot”, etc.
3. Special Education/504 Students.
  - a. Throughout this unit concrete use of tangible manipulatives such as analog clocks, base 10 blocks and place value mats, and rulers and tape measures will help support students with special needs.
  - b. Small group instruction and modeling will also help to support the learners having difficulty with the concepts.
4. Gifted and Talented Students.
  - a. Throughout this unit concepts will be extended for gifted learners by incorporating opportunities to create number stories with three digit numbers, creating different number combinations with three digit numbers, and using clues to determine mystery numbers. The counting patterns by increasing the number of cards for Top-It.

### New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

## **Unit 5: Addition and Subtraction**

**(Weeks 19-23)**

### Enduring Understanding

1. As children transition from counting every number on concrete number lines to drawing simpler open lines, children are further decontextualizing the situations in number stories and using more abstract representations.

2. As students become more mathematically proficient, they are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams.

### Essential Question(s)

1. How can I decontextualize by making connections between representations?
2. How can I use diagrams to identify quantities in practical situations?

### Learning Objectives

Students will be able to:

1. Play beat the calculator to develop fact power by using mental strategies to add two 1-digit numbers
2. Review coin equivalencies and make different combinations of coins for the same amount of money
3. Find coin combinations to pay for items and make change by counting up
4. To make purchases and practice making change
5. Make arrays, match clock faces to digital notations, and construct shapes on geoboards
6. Develop strategies for mentally adding and subtracting 10 and 100
7. Use open number lines as a tool for solving number stories
8. Solve change-to-more number stories
9. Solve parts and total number stories
10. Solve change number stories involving temperature
11. Complete an open-response problem by solving an addition problem using two different strategies

### New Jersey Student Learning Standards

- **2.MD.6** Represent whole numbers as lengths from zero 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.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
- **2.NBT.2** Count within 1000; skip-count by 5s, 10s, and 100s.
- **2.NBT.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.8** Mentally add 10 or 100 to give a number 100 - 900, and mentally subtract 10 or 100 from a given number 100-900.
- **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- **2.OA.2** Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to,:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal pages
  - d. Writing/Reasoning Prompts
  - e. Explorations: Exploring Making Arrays, Time, and Making Shapes on Geoboards
  - f. Open Response and Reengagement Lesson: Adding Multidigit Numbers
  - g. Unit 5 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
  - i. Games: *Beat the Calculator, Addition Top-It, Clock Concentration, and Number top-it*
2. English language learners.
  - a. To show children a picture of the fact power kids to help them make the connection between developing physical power by doing pull-ups and developing fact power by practicing facts.
3. Special education/504 students.
  - a. Children will use their toolkit coins to buy items and make exact change
4. Gifted and talented students.
  - a. Children will write number stories with money

### New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

## **Unit 6: Whole Number Operations and Number Stories**

**(Weeks 24-28)**

### Enduring Understanding

1. Students encounter mathematical problems every day. They need to organize information, identify what they know and what they need to find out, and decide on a solution. They begin to make sense of their problem.
2. There are numerous mathematical tools students can use to solve mathematical problems. Students must familiarize themselves with all the tools and their uses, in order to effectively choose the appropriate tool to solve a specific problem effectively.

### Essential Question(s)

1. How can students make sense of problems and persevere to solve them?
2. How can students use appropriate tools strategically?

### Learning Objectives

Students will be able to:

1. Draw picture graphs and bar graphs to represent a data set.

2. Solve comparison number stories.
3. Choose diagrams to use for solving number stories.
4. Solve animal number stories.
5. Solve two-step number stories.
6. Make ballpark estimates and invent and record their own strategies for solving addition problems.
7. Use base ten blocks to find partial sums and build readiness for partial-sums addition.
8. Introduced to partial-sums addition.
9. Complete an open response problem, compare strategies, and revise their work.
10. Build arrays on geoboards, measure and compare lengths, and create shapes.

### New Jersey Student Learning Standards

- **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
  - **2.NBT.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.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 3-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.MD.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 or rulers) and equations with a symbol for the unknown number to represent the number.
  - **2.MD.6** Represent whole numbers as lengths from zero 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.10** Draw a picture graph and 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 present in a bar graph.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal Pages
  - d. Writing/Reasoning Prompts
  - e. Explorations: Exploring Arrays Length and Shapes
  - f. Open Response and Reengagement Lesson: Number Grid Puzzles

- g. Unit 6 Progress Check and Cumulative Assessment
  - h. Ongoing Assessment through Check Ins
  - i. Games: *The Exchange Game, Salute, Beat the Calculator*
2. English Language Learners.
  - a. Scaffold learning with visuals and learning labels
3. Special Education/504 Students.
  - a. Break processes into smaller steps and
  - b. Use manipulatives
4. Gifted and Talented Students.
  - a. Apply their understanding using multiple steps and larger numbers.

#### New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

### **Unit 7: Whole Number Operations and Measurement and Data**

**(Weeks 29-33)**

#### Enduring Understanding

1. Students make conjectures and build a logical progression of statements to prove their conjecture. Students test their conjectures by manipulating data and then make new and revised conjectures if necessary.
2. Students use tools, diagrams, tables and graphs to map important quantities in a practical situation.

#### Essential Question(s)

1. How can I make mathematical conjectures and arguments?
2. How can I make sense of others' mathematical thinking?
3. How can I make real-world situations using graphs, drawings, tables, symbols, numbers, diagrams and other representations?
4. How can I use mathematical models to solve problems and answer questions?

#### Learning Objectives

Students will be able to:

1. Compare two three-digit numbers based on meanings of the hundreds, tens and ones digit using  $>$ ,  $<$  and  $=$  to record the comparisons.
2. Fluently add and subtract within 100 using strategies based on place value, properties of operations and/or the relationship between addition and subtraction.
3. Add up to four two-digit numbers using strategies based on place value and properties of operations.
4. Select appropriate measuring tools and measure the length of an object or distance to the nearest inch, foot or centimeter.
5. Measure the length of an object in both inches and centimeters and describe how the two measurements relate to the size of the unit chosen.

6. Answer simple questions about the data on a picture graph or bar graph.
7. Sort shapes and identify common attributes.

#### New Jersey Student Learning Standards

- **2.NBT.4** Compare two three-digit numbers based on meanings of the hundreds, tens and ones digit using  $>$ ,  $<$  and  $=$  to record the comparisons.
- **2.NBT.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.6** Add up to four two-digit numbers using strategies based on place value and properties of operations.
- **2.MD.1** Measure the length of an object by selecting and using appropriate tools such as, rulers, yardsticks, meter sticks and measuring tapes.
- **2.MD.2** Measure the length of an object twice using length units of different lengths for the two measurements; describe how the two measurements relate in the size of the unit chosen.
- **2.MD.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.
- **2.G.1** Recognize and draw shapes having specific attributes, such as a given number of angles, or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons and cubes.

#### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal Pages
  - d. Writing/Reasoning Prompts
  - e. Explorations: Shape Attributes, Graphs and Measurement
  - f. Open Response and Reengagement Lesson: Four or More Addends
  - g. Unit 7 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
2. English Language Learners.
  - a. Practice different ways to change numbers and names of different measurement tools.
3. Special Education/504 Students.
  - a. Practice making multiples of 10
  - b. Use base 10 blocks
  - c. Select and use measurement tools.
4. Gifted and Talented Students.
  - a. Practice adding two or more two-digit numbers and measuring crooked paths.

New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

**Unit 8: Geometry and Arrays****(Weeks 34-38)**Enduring Understanding

1. Students will use their mathematical understanding to monitor, evaluate and edit their work while also changing strategies used as needed.
2. Students will use their understanding of recognized patterns to engage in activities such as describing, sorting and comparing shapes based on various attributes.

Essential Question(s)

1. How can I make sense of problems and persevere in solving them?
2. How can I look for and make use of structure?

Learning Objectives

Students will be able to:

1. Describe the attributes of 2 dimensional shapes
2. Identify shapes that have certain attributes while playing the game shape capture
3. Build and compare various polygons
4. Draw quadrilaterals with given attributes while discussing, revising and editing work as needed
5. Sort and compare 3 dimensional shapes according to their attributes
6. Use manipulatives to partition rectangles into same size squares
7. Solve number stories about equal groups and arrays
8. Build equal groups and arrays and write number models for them
9. Play array concentration to practice finding the total number of objects in arrays and writing corresponding number models
10. Describe attributes of shapes, build polygons with trapezoids and show fractions on a geoboard

New Jersey Student Learning Standards

- **2.G.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.2** Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.
- **2.OA.1** Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

- **2.OA.2** Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
- **2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.
- **2.NBT.1a** 100 can be thought of as a bundle of ten tens - called a “hundred.”
- **2.NBT.1b** 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.2** Count within 1000; skip count by 5s, 10s, and 100s.
- **2.NBT.3** Read and write numbers to 1000 using base ten numbers, number names and expanded form.
- **2.NBT.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.6** Add up to 4 two-digit numbers using strategies based on place value and properties of operations.
- **2.NBT.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.9** Explain why addition and subtraction strategies work, using place value and the properties of operations.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to:*

1. Activities
  - a. Mental Math
  - b. Math Message
  - c. Journal Pages
  - d. Writing / Reasoning Prompts
  - e. Explorations: Exploring Mystery Shapes, Polygons and Equal Parts
  - f. Open Response and Reengagement Lesson: Drawing and Reasoning About Quadrilaterals
  - g. Unit 8 Progress Check and Open Response Assessment
  - h. Ongoing Assessment through Check Ins
2. English language learners.
  - a. Discuss the attributes of shapes and pre-teach applicable vocabulary.
  - b. Create an anchor chart to illustrate specific attributes with labels.
3. Special education/504 students.
  - a. Sort pattern blocks based upon various attributes.

4. Gifted and talented students.
  - a. Solve shape riddles based on clues of attributes of 2 dimensional shapes.

New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

**Unit 9: Equal Shares**

**(Weeks 39-43)**

Enduring Understanding

1. In Unit 9, students will become mathematically proficient in checking their answers to problems using different methods and then identifying correspondences between different approaches.
2. Students will know and use different properties of operations and objects. Children flexibly will apply properties of equal shares and multidigit numbers as they make sense of the representations they and others use.

Essential Question(s)

1. How can we use place value understanding and properties of operations to add and subtract?
2. How can we use equal groups of objects to gain foundations for multiplication?

Learning Objectives

Students will be able to:

1. Divide shapes and use fraction vocabulary to name the shares
2. Explore equal shares of different shapes, use pattern blocks to divide shapes, and make a number line
3. Decide how to share muffins equally and use words to name the shares
4. Measure lengths to the nearest half-inch
5. Write multidigit numbers in expanded form and compare them
6. Use base-10 blocks to solve subtractions problems
7. Use expand-and-trade subtraction multidigit numbers
8. Practice finding coin and bill combinations with equivalent values and using cents and dollars-and-cents notation
9. Select items from a store poster and use mental math to estimate the total cost
10. Solve number stories about 2 equal groups
11. Skip count and add to solve problems involving multiples of 10 and 15

New Jersey Student Learning Standards

- **2.OA.4** Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

- **2.NBT.1** Understand that the three digits of a three-digit number represent amounts of hundreds, tens, ones.
- **2.NBT.3** Read and write numbers to 1000 using base ten numbers, number names and expanded form.
- **2.NBT.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.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.9** Explain why addition and subtraction strategies work, using place value and the properties of operations.
- **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately.
- **2.G.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*, and so on, and describe the whole as *two-halves*, *three-thirds*, *four-fourths*. Expect children to recognize that equal shares of identical wholes need not have the same shape.

### Suggested Activities/Modifications

*Below is a list of suggested activities, modifications, accommodations, and enrichment opportunities. This includes, but is not limited to:*

#### 1. Activities

- a. Mental Math
- b. Math Message
- c. Journal pages
- c. Writing/Reasoning Prompts
- d. Explorations: Exploring Equal Shares, Pattern-Block Fractions, and Number Lines
- e. Open Response and Reengagement Lesson: Sharing Muffins
- f. Unit 9 Progress Check and Open Response Assessment
- g. Ongoing Assessment through Check Ins
- h. Games: *Subtraction Top-It*, *Shape Capture*, *Target*, *The Number-Grid Difference Game*, *Beat the Calculator*, *Basketball Addition*, *Array Concentration*, *Array Bingo*

#### 2. English Language Learners

- a. Use of visual representations such as the vocabulary picture cards, number grid and counters
- b. Support children's acquisition of descriptive vocabulary by modeling using objects
- c. Use coins and base-10 blocks to illustrate the idea of trading two different objects that are worth the same amount before teaching expand-and-trade subtraction

#### 3. Special education/504 students

- a. Modification of journal pages
  - b. Use of manipulatives counters and number grid, and vocabulary picture cards
  - c. Replacing larger addends with smaller addends
  - d. Use concrete objects to show fractional parts
4. Gifted and talented students
- a. Enrichment activity cards

New Jersey Student Learning Standards – Standards 8, 9 and Career Readiness Practices

- See Technology & Career Readiness & 21st Century Skills Standards Curriculum Appendix

**V. Course Materials** (included, but not limited to)

- Textbook: Everyday Mathematics, McGraw Hill Education Copyright 2015
- Materials: Math Masters, Classroom Posters, Assessment Handbook, *Home Connection Handbook*, Student Math Journal: Volumes 1 and 2, Homelinks, *My Reference Book*, Activity Cards
- Manipulatives: base-10 blocks, clock face, clock face stamp, coin stamp set, connectors, counters, counting sticks, dice, dominoes, Everyday Math Decks, Geoboards, Geosolids, marker boards, meter sticks, number line, pattern blocks, money, Quick Look Cards, rubber bands, rulers, stamp pad, straws, tape measure, ten frames, thermometer, yardstick
- Computer Programs: Exam View
- Internet Resources: ConnectED, eToolkit, ePresentations, Smart Notebook, Virtual Learning Community

**VI. Assessments** (included, but not limited to)

- Baseline Fact Mastery +,-
- Mid Year Fact Mastery +,-
- End of Year Fact Mastery +,-
- Unit 1-9 Progress Checks
- Odd Units- Open Response Assessment
- Even Units- Cumulative Assessments
- Ongoing Assessment Check Ins
- Writing/Reasoning Prompts

**VII. Cross Curricular Aspects**

- Literature Links can be found on unit materials page.
- Daily routines with weather and temperature connect to science standards.