# Cedar Grove School District
## Cedar Grove, NJ

# 2016 | Mathematics
# Grade 2

Approved by the Cedar Grove Board of Education
November 15, 2016

# Mathematics
## Grade 2

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.

# Grade 1 Overview

## 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.

## Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

| Grade 2 - Scope and Sequence | |
|---|---|
| Unit 1 | September – October |
| Unit 2 | November – January |
| Unit 3 | January – February |
| Unit 4 | March – April |
| Unit 5 | April – June |

# Mathematics - Grade 2

## Unit 1: Add and Subtract Within 100 and Understand Place Value to 1000

### 21<sup>st</sup> Century Themes

*E-Encouraged, T-Taught, or A-Assessed in this unit*

|  | |
|---|---|
| | Creativity and Innovation |
| | Critical Thinking and Problem Solving |
| | Communication |
| | Collaboration |

### Unit 1 Learning Targets

**Students will be able to…**

- *Construct, identify and compare sets of numbers to 1,000 using manipulatives to show quantity (M) Identify the number of ones, tens and hundreds in a two or three digit number and determine the value of each digit*
- *Read and write words that represent one, two and three digit numbers*
- *Use groups of tens to estimate quantities to 100*
- *Estimate and explain the reasonableness of a sum or difference by the magnitude of the answer Round to the nearest group of ten when estimating*
- *Distinguish between answers that use estimation and those that are exact*
- *Express two and three digit numbers in expanded form*
- *Compare and order one, two and three digit numbers applying place value concepts and using the symbols    , =*
- *Identify the ordinal position to 31st*
- *Identify even and odd in one or two digit numbers using the concept of partners or using the ones place digit*
- *Show a given whole number in equivalent ways (63, 60 + 3, 57 + 6)*
- *Take apart a whole number as a grouping of ones and tens in different ways  (63, 6 tens 3 ones, 5 tens 13 ones)*
- *Use zero to represent a value*
- *Add and subtract within 20 to solve one and two step word problems with unknowns in any position.*
- *Represent a 3-digit number as specific amounts of 100s, 10s, and 1s.*
- *Identify ten tens as 100 and represent two hundred, three hundred,….nine hundred with 2, 3,……9 hundred bundles (with zero tens and zero ones).*
- *Skip count by 5s and 10s up to 100….beginning at any multiple of 5.*
- *Read numbers to 1000 using base-ten numerals, number names, and expanded form.*
- *Write numbers to 1000 using base-ten numerals, number names, and expanded form.*
- *Use symbols , =, to record the results of comparing two 3-digit numbers by decomposing the number into a number of 100s, 10s, and 1s*

| # | Student Learning Objectives | NJSLS | Learning Activity |
|---|---|---|---|
| 1 | Add and subtract within 20 to solve 1- and 2-step word problems with unknowns in any position. | 2.OA.1 | ● |
| 2 | Represent a 3-digit number as specific amounts of 100s, 10s, and | 2.NBT.1 | ● |

| | | | |
|---|---|---|---|
| | 1s. | | |
| 3 | Identify ten tens as 100 and represent two hundred, three hundred, …, nine hundred with 2, 3, …, 9 hundred bundles  (with zero tens and zero ones). | **2.NBT.1** | ● |
| 4 | Skip count by 5s and 10s up to 100 … beginning at any multiple of 5. | **2.NBT.2** | ● |
| 5 | Read numbers to 1000 using base-ten numerals, number names, and expanded form. | **2.NBT.3** | ● |
| 6 | Write numbers to 1000 using base-ten numerals, number names, and expanded form. | **2.NBT.3** | ● |
| 7 | Use symbols >, =, <, to record the results of comparing two 3-digit numbers by decomposing the number into a number of 100s, 10s, and 1s. | **2.NBT.4** | ● |

## Selected Opportunities for Connection to Mathematical Practices

1.  **Make sense of problems and persevere in solving them.**
    SLO #1 Analyze the information given and relationships in addition and subtraction word problems.
    SLO #4 Analyze the initial number or sequence given to skip count by 5s.
    SLO #7 Analyze the information given to understand the relationships between two 3-digit numbers.
2.  **Reason abstractly and quantitatively.**
3.  SLO #1 Understand and make sense of the quantities in word problems.
    SLO #4 Understand and make sense of the relationship among the numerical values when skip counting by 5s.
    SLO #7 Make sense of the quantities and their relationship to each other when comparing two 3-digit numbers.
4.  **Construct viable arguments and critique the reasoning of others.**
    SLO #7 Create an argument using <,>, or = symbols when comparing two 3-digit numbers.
5.  **Model with mathematics.**
    SLO #1 Apply previously learned mathematical skills to solve 1 and 2-step addition and subtraction word problems.
    SLO #4 Apply previously learned skip counting skills to skip count by 5 up to 100.
6.  Use appropriate tools strategically.
7.  **Attend to precision.**
    SLO #7 Understand the meaning of the <,>, or = symbols when comparing two 3-digit numbers. Use the aforementioned symbols appropriately and consistently.
8.  **Look for and make use of structure**.
    SLO #2 Understand the pattern of decomposing numbers when representing 3-digits numbers
    SLO #3 Understand the structure when identifying and representing bundles of ten tens.
    SLO #7 Understand the pattern regarding place value and decomposition when comparing two 3-digit numbers.
Look for and express regularity in repeated reasoning.

| Unit 1 Essential Questions | Unit 1 Enduring Understandings |
|---|---|
| ● *How does the position of a digit in a number affect its value?* <br> ● *In what different ways can numbers be grouped?* <br> ● *What are strategies to make a reasonable estimate?* <br> ● *How do operations affect numbers?* <br> ● *How is an equation like a balance scale?* <br> ● *How do you use addition and subtraction to solve real world problems?* <br> ● *How does the position of a digit in a number affect its value?* <br> ● *How can we compare and contrast numbers?* | ● *The position of a digit in a number determines its value.* <br> ● *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.* <br> ● *The significance of numbers affects the outcome of operations on them.* <br> ● *The totals on each side of an equal sign equal each other, similar to that of a balance scale. Real-life situations regarding the increase or decrease of numbers/objects can be applied to addition and subtraction.* <br> ● *The overall value of a number is determined by its location within a number.* <br> ● *Two and three digit numbers can be compared based on the meaning of the hundreds, tens, and ones digits using the , and = symbols to record the results of the comparisons* |

| Standard Code # | NJ 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.1 |
| **2.NBT.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." <br>     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.2** | Count within 1000; skip-count by 5s, 10s, and 100s. |
| **2.NBT.3** | Read and write numbers to 1000 using base-ten numerals, 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 to record the results of comparisons. |
| | **Evidence of Learning** |

**Summative Assessment**
- Model Curriculum Unit Assessment
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Formative Assessment

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|---|
| ● |
| ● |
| ● |

## Instructional Materials and Resources

- ●
- ●

## Integration of Technology

- Computers
- SMART Board
- ●

## Curriculum Development Resources

- http://www.state.nj.us/education/cccs/2016/math/standards.pdf
- http://www.state.nj.us/education/modelcurriculum/math/2.shtml
- http://www.state.nj.us/education/cccs/standards/9/9.pdf

# Mathematics - Grade 2

## Unit 2: Understanding the Meaning and Application of Addition and Subtraction

### 21<sup>st</sup> Century Themes

*E-Encouraged, T-Taught, or A-Assessed in this unit*

|  | Creativity and Innovation |
|--|---------------------------|
|  | Critical Thinking and Problem  Solving |
|  | Communication |
|  | Collaboration |

### Unit 2 Learning Targets

**Students will be able to…**

- *Recognize that groups of even numbers can be counted by 2s and that in groups of odd numbers objects will not pair up evenly*
- *Write an equation to illustrate that all even numbers can be formed from the addition of two equal addends*
- *Add up to four two-digit numbers based on place value and properties of operations*
- *Count within 1000 by ones, 5s, 10s, and 100s beginning at any multiple of 1, 5, 10, or 100*
- *Add and subtract fluently within ten using mental strategies.*
- *Use various strategies such as place value, properties of operations, etc. to add and subtract numbers within 50*
- *Construct, identify and compare sets of numbers to 1,000 using manipulatives to show quantity*
- *Identify the number of ones, tens and hundreds in a two or three digit number and determine the value of each digit*
- *Read and write words that represent one, two and three digit numbers*
- *Estimate and explain the reasonableness of a sum or difference by the magnitude of the answer*
- *Round to the nearest group of ten when estimating*
- *Express two and three digit numbers in expanded form*
- *Compare and order one, two and three digit numbers applying place value concepts and using the symbols <, >, =*

| # | Student Learning Objectives | NJSLS | Learning Activity |
|---|------------------------------|-------|-------------------|
| 1 | Recognize that in groups of even numbers objects can be counted by 2s and that in groups of odd numbers objects will not pair up evenly. | **2.OA.3** | ● |
| 2 | Write an equation to illustrate that all even numbers can be formed from the addition of two equal addends. | **2.OA.3** | ● |
| 3 | Add up to four two-digit numbers based on place value and properties of operations. | **2.NBT.6** | ● |
| 4 | Count within 1000 by ones, 5s, 10s, and 100s beginning at any multiple of 1, 5, 10 or 100 (e.g., begin at 505 | **2.NBT.2** | ● |

| | and skip count by 5 up to 605, or begin at 600 and skip count by 100 up to 1000). | | |
|---|---|---|---|
| **5** | Add and subtract fluently within ten using mental strategies (within 10). | **2.OA.2** | ● |
| **6** | Use a variety of strategies (place value, properties of operation, and/or the relationship between addition and subtraction) to add and subtract within 50. | **2.NBT.5** | ● |

| Selected Opportunities for Connection to Mathematical Practices |
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1. **Make sense of problems and persevere in solving them.**
    SLO #1 Analyze given information in order to make conclusion about even and odd numbered groups.
    SLO #2 Analyze the relationship between two equal addends in an addition problem in order to form an equation illustrating that all even numbers can be formed from the addition of two equal addends.
    SLO #6 Analyze the relationship between addition and subtraction and recognize the constraints in the properties of operations in order to add and subtract within 50.
2. **Reason abstractly and quantitatively.**
    SLO #6 Know and flexibly use properties of operation to solve addition problems within 50.
    SLO #1 Understand and make sense of quantities of objects in both even and odd numbered groups.
    SLO #8 Make sense of quantities and their relationships when adding, subtracting, decomposing, and composing numbers within 20.
3. Construct viable arguments and critique the reasoning of others.
4. **Model with mathematics.**
    SLO #2 Apply previously learned skills regarding addition of even numbers to write an equation illustrating that all even numbers can be formed from the addition of two equal addends.
5. Use appropriate tools strategically.
6. Attend to precision.
7. **Look for and make use of structure.**
    SLO #1 Recognize and discern patterns about groups of even and odd numbered sets.
8. Look for and express regularity in repeated reasoning.

| Unit 2 Essential Questions | Unit 2 Enduring Understandings |
|---|---|
| ● *How does the position of a digit in a number affect its value?*<br>● *In what different ways can numbers be grouped?*<br>● *How can memorizing the basic addition and subtraction facts help me?*<br>● *How does understanding place value help you solve double digit addition and subtraction problems?*<br>● *What are efficient methods for* | ● *The position of a digit in a number determines its value.*<br>● *The groupings of ones, tens and hundreds for a given number can be taken apart in different ways.*<br>● *Knowledge of addition and subtraction facts makes the computation of larger numbers easier to solve.*<br>● *Numbers can be aligned in accordance with place value to correctly add denominations of ten. Flexible methods of computation involve grouping* |

| | |
|---|---|
| *finding sums and differences?* | *numbers in strategic ways. Mental math strategies can be used to solve problems involving numbers.* |

| Standard Code # | NJ Student Learning Standards |
|---|---|
| **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; write an equation to express an even number as a sum of two equal addends. |
| **2.NBT.6** | Add up to four two-digit numbers using strategies based on place value and properties of operations. |
| **2.NBT.2** | Count within 1000; skip-count by 5s, 10s, and 100s. |
| **2.OA.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. |
| **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. |
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## Evidence of Learning

**Summative Assessment**
- Model Curriculum Unit Assessment
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**Formative Assessment**
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**Instructional Materials and Resources**
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**Integration of Technology**
- Computers
- SMART Board
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**Curriculum Development Resources**
- http://www.state.nj.us/education/cccs/2016/math/standards.pdf
- http://www.state.nj.us/education/modelcurriculum/math/2.shtml
- http://www.state.nj.us/education/cccs/standards/9/9.pdf

# Mathematics - Grade 2

## Unit 3: Compare Lengths-Measures in Standards Units-Foundations of Multiplication

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|---|---|
| | Creativity and Innovation |
| | Critical Thinking and Problem  Solving |
| | Communication |
| | Collaboration |

### Unit 1 Learning Targets

**Students will be able to…**

- *Write an addition equation with repeated equal addends from a rectangular array that has up to 5 rows and 5 columns to determine the total number*
- *Measure or estimate lengths of objects using appropriate tools (inches, feet, etc.)*
- *Compare measurements of an object obtained with two different units of measure and explain that the difference in the measurements is due to the size of the unit chosen*
- *Compare lengths of two objects and determine how much longer one object is than the other using the same standard unit of measure*
- *Orally count within 1000 including skip-counting by 5s, 10s, and 100s*
- *Add fluently within 20 using mental strategies*
- *Choose an appropriate strategy to add and subtract within 100*
- *Compare lengths to determine the difference in length*
- *Compare two different measurements taken with different measurement units*
- *Identify and describe measurable attributes including length, weight, and temperature*
- *Determine the area and perimeter of squares and rectangles using manipulatives or representative drawings*
- *Choose and use measurement tools appropriately*
- *Measure in nonstandard and standard units (half inches, inches, feet, yards, centimeters, meters, pounds, and degrees Fahrenheit)*

| # | Student Learning Objectives | NJSLS | Learning Activity |
|---|---|---|---|
| 1 | Write an addition equation with repeated equal addends from a rectangular array with up to 5 rows and 5 columns and solve to find the total number. | **2.OA.4** | ● |
| 2 | Estimate or measure lengths of objects using appropriate tools (inches, centimeters, feet, and meters). | **2.MD.1** **2.MD.3** | ● |
| 3 | Compare measurements of an object taken with two different units of measure and explain that the difference is related to the size of unit chosen. | **2.MD.2** | ● |
| 4 | Compare lengths of two objects and determine how much longer one | **2.MD.4** | ● |

| | object is than another using the same standard of measure. | | |
|---|---|---|---|
| 5 | Orally count within 1000 including skip-counting by 5s, 10s, and 100s. | **2.NBT.2** | ● |
| 6 | Add fluently within 20 using mental strategies, such as decomposing and composing numbers using the ten as a benchmark number. | **2.OA.2** | ● |
| 7 | Choose a strategy (place value, properties of operation, and/or the relationship between addition and subtraction) to add and subtract within 100. | **2.NBT.5** | ● |

## Selected Opportunities for Connection to Mathematical Practices

1. **Make sense of problems and persevere in solving them.**
   SLO #1 Analyze the relationship between equal addends in order to write and equation regarding a rectangular array.
   SLO #2 Use concrete models to help estimate and measure lengths of objects.
2. **Reason abstractly and quantitatively.**
   SLO #1 Make sense of the quantities in the rows and columns in a rectangular array in order to write an equation regarding the array.
   SLO #2 Use quantitative reasoning to create an abstract image of the object being measured or estimated.
   SLO #6 Understand and make sense of the quantities and their relationships to each other when using mental strategies to add, compose, and decompose numbers.
   SLO # 7 Know and flexibly use the properties of operations to solve addition and subtraction equations within 100.
3. **Construct viable arguments and critique the reasoning of others.**
   SLO #3 Use coherent logic or reasoning to explain the choice of measurement used when measuring various objects.
4. **Model with mathematics.**
   SLO #1 Apply previously learned skills regarding equal addends in order to write an equation regarding a rectangular array.
5. **Use appropriate tools strategically.**
   SLO #1 Use appropriate tools (diagrams or models) to write an equation regarding a rectangular array.
   SLO #2 Use appropriate tools when estimating or measuring the lengths of objects.
   SLO #3 Use appropriate tools and measurement units when measuring various objects of different sizes.
6. **Attend to precision.**
   SLO #2 Specify units of measure of the objects being measured (inches, centimeters, feet, and meters).

| Unit 3 Essential Questions | Unit 3 Enduring Understandings |
|---|---|
| ● *What units and tools measure the different attributes?*<br>● *Why are standard units of measurement used?*<br>● *Why are units used in measuring?*<br>● *How are perimeter and area different?* | ● *Specific tools measure specific attributes.*<br>● *A measurement must contain a number and a unit.* |

| | *How does estimation help us with measurement?* | |
|---|---|---|

| Standard Code # | NJ 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.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.3** | Estimate lengths using units of inches, feet, centimeters, and meters. |
| **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.4** | Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit. |
| **2.NBT.2** | Count within 1000; skip-count by 5s, 10s, and 100s. |
| **2.OA.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. |
| **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. |
| **Evidence of Learning** | |

**Summative Assessment**
- Model Curriculum Unit Assessment
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**Formative Assessment**
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**Instructional Materials and Resources**
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**Integration of Technology**
- Computers
- SMART Board
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**Curriculum Development Resources**
- http://www.state.nj.us/education/cccs/2016/math/standards.pdf
- http://www.state.nj.us/education/modelcurriculum/math/2.shtml
- http://www.state.nj.us/education/cccs/standards/9/9.pdf

# Mathematics - Grade 2

## Unit 4: Addition and Subtraction Using Place Value and Measurement

### 21st Century Themes

*E-Encouraged, T-Taught, or A-Assessed in this unit*

| | |
|---|---|
| | Creativity and Innovation |
| | Critical Thinking and Problem  Solving |
| | Communication |
| | Collaboration |

### Unit 1 Learning Targets

**Students will be able to…**

- *Apply properties of place value to mentally add or subtract 10 or 100 from a given number within 100-900*
- *Apply addition and subtraction strategies based on place value and the properties of operations. Also, explain why these strategies work using objects or drawings*
- *Add and subtract within 100 in word problems involving lengths using a symbol to represent the unknown number*
- *Use a number line to represent the solution of whole number sums and differences related to length within 100 by using equally spaced points*
- *Tell and write time using analog and digital clocks to the nearest five minutes using AM and PM*
- *Identify, recognize, and solve word problems with dollar bills, quarters, dimes, nickels, and pennies using the dollar and cent symbols appropriately*
- *Add and subtract within 100 to solve 1 or 2 step word problems with unknowns in any position*
- *Add and subtract fluently within 20 using mental strategies such as decomposing and composing*

| # | Student Learning Objectives | NJSLS | Learning Activity |
|---|---|---|---|
| 1 | Apply properties of place value to mentally add or subtract 10 or 100 to/from a given number within 100-900. | **2.NBT.8** | ● |
| 2 | Apply addition and subtraction strategies based on place value and the properties of operations and explain why these strategies work using drawings or objects.  For example, 37 + 12 = 49 because 37 +12 equals 30 + 7 + 10 + 2 (place value) which equals 30 + 10 + 7 + 2 (property of operations). | **2.NBT.9** | ● |
| 3 | Add and subtract within 100 in word problems involving lengths using a symbol to represent the unknown number.  For example, if Angela needs 30 feet of ribbon for gifts, but she only has 17 feet, equations 17 + $x$ = 30 and 30 – $x$ = 17 both | **2.MD.5** | ● |

| | | | |
|---|---|---|---|
| | represent the *x* feet she still needs. | | |
| 4 | Use a number line to represent the solution of whole number sums and differences related to length within 100 by using equally spaced points. | **2.MD.6** | ● |
| 5 | Tell and write time using analog and digital clocks to the nearest five minutes using AM and PM. | **2.MD.7** | ● |
| 6 | Identify, recognize, and solve word problems with dollar bills, quarters, dimes, nickels, and pennies using the **$** and **¢** symbols appropriately. | **2.MD.8** | ● |
| 7 | Add and subtract within 100 to solve 1- or 2-step word problems with unknowns in any position. | **2.OA.1** | ● |
| 8 | Add and subtract fluently within 20 using mental strategies, such as decomposing and composing numbers using the benchmark of ten. | **2.OA.2** | ● |

## Selected Opportunities for Connection to Mathematical Practices

1. **Make sense of problems and persevere in solving them.**
   SLO #2 Explain how (using drawings or objects) strategies based on place value or properties of operations work to solve addition and subtraction problems.
   SLO #3 Analyze the relationship among numbers or quantities in addition or subtraction word problems regarding lengths in order to solve.
2. **Reason abstractly and quantitatively.**
   SLO #2 Know and flexibly apply properties of operations as they relate to addition and subtraction problems.
   SLO #3 Use quantitative reasoning to create a coherent representation of addition and subtraction word problems regarding length.
   SLO #8 Make sense and understand quantities and their relationships when adding, subtracting, decomposing, and composing numbers within 20.
3. Construct viable arguments and critique the reasoning of others.
4. **Model with mathematics.**
   SLO #2 Use drawings and diagrams to help explain strategies related to addition and subtraction.
   SLO #3 Apply previously learned addition and subtraction skills to solve word problems involving lengths and having unknown quantities represented by symbols.
5. **Use appropriate tools strategically.**
6. Attend to precision.
7. **Look for and make use of structure.**
   SLO #2 Look for and discern patterns relating to addition and subtraction.
8. Look for and express regularity in repeated reasoning.

| Unit 4 Essential Questions | Unit 4 Enduring Understandings |
|---|---|
| ● *What strategies do I use to effectively compute sums and differences mentally? How can I model and solve problems by representing, adding, and subtracting amounts of money?* | ● *Mental math strategies can be utilized to solve problems involving numbers such as zero facts, counting on, doubles, making tens, counting back, etc.*<br>● *Regrouping may be used to add and* |

- *Why is it important to understand the values of coins and bills? How can I represent the same amount of money using different combinations of coins and bills?*
- *What units are used to measure the attributes of time? How can I tell time using both analog and digital clocks?*
- *How is measurement related to addition and subtraction?*

subtract whole numbers.
- *Addition can be modeled through buying items from a store advertisement or adding up all the money in a piggy bank.*
- *Subtraction can be modeled by making sure the correct amount of change has been given with a money problem.*
- *Coins and bills are symbols for amounts of money. We can create equal amounts of money using different combinations of coins and bills. Coins and bills also provide options for money equivalencies.*
- *Analog and digital clocks can measure time to the nearest five minutes. Analog clocks closely resemble a number line, however digital clocks require the use of place value to tell time.*

| Standard Code # | NJ 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.  By end of Grade 2, know from memory all sums of two one-digit numbers. |
| **2.NBT.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.9** | Explain why addition and subtraction strategies work, using place value and the properties of operations.  (Explanations can be supported by drawings or objects). |
| **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 of rulers) and equations with a symbol for the unknown number to represent the problem. |
| **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, ..., and represent whole-number sums and differences within 100 on a number line diagram. |
| **2.MD.7** | Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m. |
| **2.MD.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?* |
| **Evidence of Learning** | |

**Summative Assessment**
- Model Curriculum Unit Assessment
-

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|---|
| ● |

| Formative Assessment |
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| ● |
| ● |
| ● |

| Instructional Materials and Resources |
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| ● |
| ● |

| Integration of Technology |
|---|
| ● Computers |
| ● SMART Board |
| ● |

| Curriculum Development Resources |
|---|
| ● http://www.state.nj.us/education/cccs/2016/math/standards.pdf |
| ● http://www.state.nj.us/education/modelcurriculum/math/2.shtml |
| ● http://www.state.nj.us/education/cccs/standards/9/9.pdf |

# Mathematics - Grade 2

## Unit 5: Represent Data and Recognize Shapes and Their Attributes

### 21st Century Themes
*E-Encouraged, T-Taught, or A-Assessed in this unit*

|  | Creativity and Innovation |
|---|---|
|  | Critical Thinking and Problem Solving |
|  | Communication |
|  | Collaboration |

### Unit 5 Learning Targets

**Students will be able to…**

**Unit 5 Summary:**
- *Gather data through a survey or observation*
- *Organize and display data in more than one way*
- *Interpret data from tally charts, glyphs, Venn diagrams, pictographs, bar graphs, and line plots in terms of most, least, more, less and equal*
- *Solve simple put together, take apart, and compare problems using information from a bar graph and a pictograph*
- *Understand and interpret different types of scales*
- *Show measurement data by making a line plot, where the horizontal scale is in whole number units*
- *Apply addition and subtraction strategies to add and subtract like units and compose or decompose higher value units when needed*
- *Compute sums and differences of one, two, and three-digit numbers within 1000 using strategies based on place value, properties of operations, and/or the inverse relationship between addition and subtraction*
- *Explain why addition and subtraction strategies work using place value and the properties of operations*
- *Measure and repeat measures of several objects to the nearest whole unit then represent the data on a line plot*
- *Draw picture and bar graphs to represent data as well as solve problems using information presented on a bar graph*
- *Draw and identify shapes that have specific attributes*
- *Decompose rectangular and circular objects into two, three, or four equal parts Be able to describe the parts using words such as halves, thirds, etc.*
- *Add and subtract fluently within 20 using mental strategies*
- *Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction*

| # | Student Learning Objectives | NJSLS | Learning Activity |
|---|---|---|---|
| 1 | 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 | 2.NBT.7 | ● |

| | | | ● |
|---|---|---|---|
| | hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds. | | |
| 2 | Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.  (Sizes are compared visually or directly, not compared by measuring.) Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. | 2.G.1 | ● |
| 3 | Use tools of measurement to measure lengths of several objects to the nearest whole unit and represent the data on a line plot with appropriate whole number units on the horizontal scale. | 2.MD.9 | ● |
| 4 | Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories.  Solve simple put-together, take-apart, and compare problems using information presented in the graph. | 2.MD.10 | ● |
| 5 | Partition a rectangle into rows and columns of same-size squares and count to find the total number. | 2.G.2 | ● |
| 6 | 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. | 2.G.3 | ● |
| 7 | Fluently add and subtract within 20 using mental strategies.  By the end of Grade 2, know from memory all sums of two one-digit numbers. | 2.OA.2 | ● |
| 8 | 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.5 | ● |

| Selected Opportunities for Connection to Mathematical Practices |
|---|
| 1.  **Make sense of problems and persevere in solving them.**<br>     SLO #2 Analyze given information and attributes about unknown shapes in order to draw the specified shape. |

2. **Reason abstractly and quantitatively.**
   SLO #8 know and flexibly use the properties of operations in order to understand the relationship between addition and subtraction.
3. **Construct viable arguments and critique the reasoning of others.**
   SLO #4 Construct viable and logic arguments based on a picture graph and a bar graph.
4. **Model with mathematics.**
   SLO #4 Use tools such as diagrams and graphs in order to better identify, create, and analyze the components of a dataset.
5. **Use appropriate tools strategically.**
   SLO #5 Use appropriate and available tools to partition a rectangle into rows and columns of the same size in order to count the total.
6. **Attend to precision.**
   SLO #6 Use clear and precise definitions to discuss the division of circles and rectangles into equal shares (for example: half, third, or half of).
7. **Look for and make use of structure.**
   SLO #8 Look for and discern a pattern or relationship based on place value concepts or properties of operations in the context of addition or subtraction.
8. Look for and express regularity in repeated reasoning.

| Unit 5 Essential Questions | Unit 5 Enduring Understandings |
|---|---|
| ● *What are some ways that data can be gathered, organized and displayed to communicate information?*<br>● *What questions can be answered from a graph, glyph, chart or a diagram?*<br>● *How do fractions help you share equally?*<br>● *How can spatial relationships and objects be represented by the use of geometric language?*<br>● *How do you demonstrate the relationship between numbers, quantities, and place value for whole numbers up to 1,000?*<br>● *How do you find sums and differences by taking apart and recombining numbers in a variety of ways?*<br>● *What are different ways that data can be displayed?* | ● *Data can be gathered and displayed in an organized and concise way.*<br>● *Fractional parts are equal shares of a whole number, whole object, or a whole set.*<br>● *Geometric solids and figures can be combined or cut apart to form equal parts. Flat surfaces can be covered by a group of squares. Geometric figures can be constructed by geometric properties.*<br>● *Place value can help to determine which numbers are larger or smaller than other numbers.*<br>● *Problems involving numbers may be simplified by using the commutative, associate, and identity properties. Regrouping can also be used to add and subtract whole numbers.*<br>● *Data can be conveyed in a concise way by using graphs (bar and line).* |

| Standard Code # | NJ Student Learning Standards |
|---|---|
| **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.G.1** | Recognize and draw shapes having specified attributes, such as a given |

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| | number of angles or a given number of equal faces.  (Sizes are compared visually or directly, not compared by measuring.)  Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. |
| **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.  Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units. |
| **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 the graph. |
| **2.G.2** | Partition a rectangle into rows and columns of same-size squares and count to find the total number of them. |
| **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, 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. |
| **2.OA.2** | Fluently add and subtract within 20 using mental strategies.  By the end of Grade 2, know from memory all sums of two one-digit numbers. |
| **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. |

## Evidence of Learning

### Summative Assessment

- Model Curriculum Unit Assessment
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### Formative Assessment

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### Instructional Materials and Resources

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### Integration of Technology

- Computers
- SMART Board
- 

### Curriculum Development Resources

- http://www.state.nj.us/education/cccs/2016/math/standards.pdf
- http://www.state.nj.us/education/modelcurriculum/math/2.shtml
- http://www.state.nj.us/education/cccs/standards/9/9.pdf

# NJ Student Learning Standards for Mathematics
# Grade 2

## Operations & Algebraic Thinking

Standards in this domain

NJSLS.MATH.CONTENT.2.OA.A.1
NJSLS.MATH.CONTENT.2.OA.B.2
NJSLS.MATH.CONTENT.2.OA.C.3
NJSLS.MATH.CONTENT.2.OA.C.4

### Represent and solve problems involving addition and subtraction.

**2.OA.A.1**
Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.[1]

### Add and subtract within 20.

**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.

### Work with equal groups of objects to gain foundations for multiplication.

**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.

[1] See Glossary, Table 1.
[2] See standard 1.OA.6 for a list of mental strategies.

# Number & Operations in Base Ten

## Understand place value.

**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.

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

**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.[1]

[1] Explanations may be supported by drawings or objects.

# Measurement & Data
## Standards in this domain

NJSLS.MATH.CONTENT.2.MD.A.1
NJSLS.MATH.CONTENT.2.MD.A.2
NJSLS.MATH.CONTENT.2.MD.A.3
NJSLS.MATH.CONTENT.2.MD.A.4
NJSLS.MATH.CONTENT.2.MD.B.5
NJSLS.MATH.CONTENT.2.MD.B.6
NJSLS.MATH.CONTENT.2.MD.C.7
NJSLS.MATH.CONTENT.2.MD.C.8
NJSLS.MATH.CONTENT.2.MD.D.9
NJSLS.MATH.CONTENT.2.MD.D.10

## Measure and estimate lengths in standard units.

**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.

### Relate addition and subtraction to length.

### 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.

### Work with time and money.

### 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. Example: If you have 2 dimes and 3 pennies, how many cents do you have? *Represent and interpret data.*

### 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[1] using information presented in a bar graph.

[1] See Glossary, Table 1

# Geometry
### Standards in this domain
NJSLS.MATH.CONTENT.2.G.A.1
NJSLS.MATH.CONTENT.2.G.A.2
NJSLS.MATH.CONTENT.2.G.A.3

### Reason with shapes and their attributes.

## 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.[1] 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.

[1] Sizes are compared directly or visually, not compared by measuring.