

Cedar Grove School District

Cedar Grove, NJ

2016 | **Mathematics**
Grade 1

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

Superintendent of Schools
Michael Fetherman

Board of Education
Mrs. Christine Dye, President
Mr. Frank Mandala, Jr., Vice-President
Mrs. Pamela Burke
Mr. Peter Prvulovic
Mr. David Schoner

Mathematics

Grade 1

In Grade 1, instructional time should focus on four critical areas: (1) developing understanding of addition, subtraction, and strategies for addition and subtraction within 20; (2) developing understanding of whole number relationships and place value, including grouping in tens and ones; (3) developing understanding of linear measurement and measuring lengths as iterating length units; and (4) reasoning about attributes of, and composing and decomposing geometric shapes.

1. Students develop strategies for adding and subtracting whole numbers based on their prior work with small numbers. They use a variety of models, including discrete objects and length-based models (e.g., cubes connected to form lengths), to model add-to, take-from, put-together, take-apart, and compare situations to develop meaning for the operations of addition and subtraction, and to develop strategies to solve arithmetic problems with these operations. Students understand connections between counting and addition and subtraction (e.g., adding two is the same as counting on two). They use properties of addition to add whole numbers and to create and use increasingly sophisticated strategies based on these properties (e.g., “making tens”) to solve addition and subtraction problems within 20. By comparing a variety of solution strategies, children build their understanding of the relationship between addition and subtraction.
2. Students develop, discuss, and use efficient, accurate, and generalizable methods to add within 100 and subtract multiples of 10. They compare whole numbers (at least to 100) to develop understanding of and solve problems involving their relative sizes. They think of whole numbers between 10 and 100 in terms of tens and ones (especially recognizing the numbers 11 to 19 as composed of a ten and some ones). Through activities that build number sense, they understand the order of the counting numbers and their relative magnitudes.
3. Students develop an understanding of the meaning and processes of measurement, including underlying concepts such as iterating (the mental activity of building up the length of an object with equal-sized units) and the transitivity principle for indirect measurement.¹
4. Students compose and decompose plane or solid figures (e.g., put two triangles together to make a quadrilateral) and build understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine shapes, they recognize them from different perspectives and orientations, describe their geometric attributes, and determine how they are alike and different, to develop the background for measurement and for initial understandings of properties such as congruence and symmetry.

**This curriculum was written in accordance with the
NEW JERSEY STUDENT LEARNING STANDARDS
for Mathematics**

The standards can be viewed at

<http://www.state.nj.us/education/cccs/2016/math/standards.pdf>

Grade 1 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving addition and subtraction.
- Understand and apply properties of operations and the relationship between addition and subtraction.
- Add and subtract within 20.
- Work with addition and subtraction equations.
- Number and Operations in Base Ten
- Extend the counting sequence.
- Understand place value.
- Use place value understanding and properties of operations to add and subtract.

Measurement and Data

- Measure lengths indirectly and by iterating length units.
- Tell and write time.
- 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.

¹ Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this technical term.

Grade 1 - 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 1

Unit 1: Add and Subtract Within 20

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...

- *Describe and record basic addition/subtraction facts to 10 with manipulatives*
- *Use appropriate vocabulary; plus, minus, equals, sum, difference and addends*
- *Construct and investigate the sums of 1 and 2 digit numbers without regrouping using manipulatives*
- *Use a number line to solve addition and subtraction problems*
- *Construct and describe fact families to 10*
- *Model and describe doubles (+/-)*
- *Solve addition problems with three whole numbers with sums less than or equal to 20*
- *Count forwards and backwards from any number within 20 to solve appropriate addition and subtraction problems*
- *Use strategies to solve addition and subtraction problems within 20 (i.e.; decomposing a number, make 10, etc.)*
- *Add within 100 including a two-digit number and a one-digit number*
- *Add a two-digit number and a multiple of ten*
- *Count numbers up to 100 orally as well as in a written format*
- *Compose and decompose numbers to 20 using tens and ones*
- *Add/ subtract numbers within 20*
- *Solve addition and subtraction problems using unknown addends*
- *Apply commutative and associative properties when adding*

#	Student Learning Objectives	NJSLS	Learning Activity
1	Count utilizing written or verbal numerals starting at any number less than 100.	1.NBT.1	<ul style="list-style-type: none"> ● Use concrete objects to count ● Work in groups to write a story including the number of various objects. ● Use a hundreds chart to practice skip counting
2	Count forward or backwards from any number within 20 to solve addition & subtraction problems.	1.OA.5	<ul style="list-style-type: none"> ● Use concrete objects to add and subtract ● Use dice to play addition or subtraction game ● Use a number line to add or subtract
3	Compose and decompose numbers to 20 to identify the value of the number in the tens & ones place.	1.NBT.2	<ul style="list-style-type: none"> ● Have children make riddles about numbers ● Use a tens frame to identify

			value of numbers
4	Add or subtract whole numbers within 20 using strategies including making a 10 or decomposing a number leading to a 20.	1.OA.6	<ul style="list-style-type: none"> Use pictures to “add to” and “taking from” Use vocabulary to label pictures to show examples of adding to
5	Apply properties of operations to add or subtract whole numbers within 20 (Commutative & Associative properties of addition).	1.OA.3	<ul style="list-style-type: none"> Ask a partner to explain properties of addition and subtraction Use different color connecting cubes to show properties Draw a picture to show how to add in any order Use dominos to show commutative property
6	Solve subtraction problems using unknown addends (within 20).	1.OA.4	<ul style="list-style-type: none"> Make a bar model to solve Write a story that involves finding a missing addend Act out word problems to find unknown addend

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
 - SLO #3 Explain what it means to decompose a number into two separate quantities (less than or equal to 20).
 - SLO #4 Understand that the decomposition of numbers is a starting point to solving addition or subtraction of whole numbers within 20.
 - SLO #6 Know the process and necessary information needed to solve subtraction problems with unknown addends (within 20).
2. Reason abstractly and quantitatively.
 - SLO #3 Reason about the quantities and relationship among the decomposed parts of numbers and the composed number (up to 20).
 - SLO #4 Understand what each decomposed number represents in relation to an addition or subtraction problem within 20.
 - SLO #5 Know how to correctly and appropriately apply the property of operations to either addition or subtraction problems (e.g. commutative and associative properties can be applied to addition but not subtraction problems).
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.
 - SLO #3 Understand the structure of decomposed numbers (the two addends are equivalent to the number being decomposed).
 - SLO #4 Look for a pattern or structure in the steps to solving addition or subtraction problems (within 20).
8. Look for and express regularity in repeated reasoning.

Unit 1 Essential Questions

- *There are many ways to use addition and subtraction.*
- *Addition and subtraction are inverse operations.*

Unit 1 Enduring Understandings

- *How does knowing basic facts help make basic problem solving easier?*
- *How can problem solving strategies be used to join, separate, or compare*

<ul style="list-style-type: none"> • Quantities can be joined, separated, or compared. • Proficiency with basic facts facilitates the ability to solve problems in contexts. • What are addition and subtraction and how are they used? • How can addition and subtraction problems be solved? • How are addition and subtraction related? 	<p>sets?</p> <ul style="list-style-type: none"> • How can quantities, operations, or relationships be represented by symbols? • Addition and subtraction are used to model real world situations such as counting on from one day to another, determining an amount needed to earn a reward. • Use number lines, hundreds chart, base ten blocks, counters as well as other manipulatives to solve addition and subtraction problems. • Addition and subtraction are opposite numerical operations that are used to help to quickly find answers to equations.
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Standard Code #	NJ Student Learning Standards
1.NBT.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.
1.OA.5	Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).
1.NBT.2	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: <ul style="list-style-type: none"> a. 10 can be thought of as a bundle of ten ones - called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1.OA.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).
1.OA.3	Apply properties of operations as strategies to add and subtract. ³ <i>Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)</i>
1.OA.4	Understand subtraction as an unknown-addend problem. <i>For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.</i>
Evidence of Learning	
Summative Assessment	
<ul style="list-style-type: none"> • Model Curriculum Unit Assessment • Mid-chapter check point • End of chapter test 	
Formative Assessment	
<ul style="list-style-type: none"> • Lesson check/spiral review • Quick checks 	

Instructional Materials and Resources

- Go Math series
- www.ixl.com
- What Makes 10? song <https://www.youtube.com/watch?v=XpoFwxKBwE8>
- *The Doorbell Rang* by Pat Hutchins
- www.abcya.com
- www.thinkcentral.com
- Manipulatives (base ten blocks, counters, dominos, dice)

Integration of Technology

- Computers
- SMART Board
- Interactive games

Curriculum Development Resources

- <http://www.state.nj.us/education/cccs/2016/math/standards.pdf>
- <http://www.state.nj.us/education/modelcurriculum/math/1.shtml>
- <http://www.state.nj.us/education/cccs/standards/9/9.pdf>

Mathematics- Grade 1

Unit 2: Word Problems Involving Addition and Subtraction

21st 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...

- *Use addition and subtraction within 20 to solve word problems.*
- *Solve word problems using 3 whole numbers.*
- *Determine if an equation is true or false.*
- *Read, write, and count to 120.*
- *Solve an addition or subtraction equation with a missing whole number.*
- *Count forwards and backwards from any number within 20 to solve appropriate addition and subtraction problems*
- *Use strategies to solve addition and subtraction problems within 20 (i.e.; decomposing a number, make 10, etc.)*
- *Add within 100 including a two-digit number and a one-digit number*
- *Add a two-digit number and a multiple of ten*

#	Student Learning Objectives	NJSL S	Learning Activity
1	Use addition and subtraction within 20 to solve word problems involving situations or adding to, taking from, putting together, taking apart, and comparing with unknowns in all positions.	1.OA.1	<ul style="list-style-type: none"> ● Use MathBoards to show solutions ● Use doubles strategy to solve word problems
2	Solve addition word problems with three whole numbers with sums less than or equal to 20.	1.OA.2	<ul style="list-style-type: none"> ● Use counters to add ● Use connecting cubes in 3 colors to add ● Explain to a partner how to add 3 addends ● Play Beat the Calculator
3	Demonstrate understanding of the equal sign by determining if an equation is true or false.	1.OA.7	<ul style="list-style-type: none"> ● Draw a picture to show if an equation is true or false ● Color cards that equal the same number
4	Solve addition or subtraction equations by finding the missing whole number in any position.	1.OA.8	<ul style="list-style-type: none"> ● Use connecting cubes to solve equations ● Make math triangles to identify missing number

5	Count to 120, starting at any number less than 120.	1.NB T.1	<ul style="list-style-type: none"> ● Use flash cards to practice facts ● Skip count by 2, 5 and 10 to practice numbers ● Solve a “mystery picture” by coloring numbers on a hundreds chart
6	Read and write numerals to 120 including representing a number of objects with a written numeral.	1.NB T.1	<ul style="list-style-type: none"> ● Draw a picture to represent a number ● Play number bingo to identify numbers to 120 ● Play interactive math game to identify numbers

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
 SLO #1 Know the process and necessary information needed to solve addition and subtraction word problems with unknown quantities (within 20).
 SLO #2 Analyze the information given in an addition word problem (with three numbers) in order to solve the problem.
 SLO #4 Analyze equations with missing values in any position and be able to solve the equations.
2. Reason abstractly and quantitatively.
 SLO #1 Understand the known and unknown quantities in word problems and how they relate to solving the problem.
 SLO #2 Understand what the numbers in different word problems represent and how the information is relevant to the solution.
 SLO #6 Know how to represent the quantity or set of objects with a written numeral of any number less than 120.
3. Construct viable arguments and critique the reasoning of others.
 SLO #3 Understand the quantities in an equation and demonstrate this understanding by applying the equal sign correctly.
4. Model with mathematics.
 SLO #1 be able to write a mathematical equation based on a word problem.
 SLO #2 Apply previously learned addition skills to solve addition word problems (with three numbers).
5. Use appropriate tools strategically.
6. Attend to precision.
 SLO #3 Understand the meaning of the equal sign and apply the sign consistently and appropriately to equations.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Unit 2 Essential Questions	Unit 2 Enduring Understandings
<ul style="list-style-type: none"> ● <i>How can addition and subtraction problems be modeled and solved?</i> ● <i>How can addition and subtraction sentences be written?</i> ● <i>How do you use addition and subtraction to solve real world word problems?</i> 	<ul style="list-style-type: none"> ● <i>Addition and subtraction problems are solved by counting on (adding) or counting back (subtracting) using counters, number lines, hundreds chart, connecting cubes, base ten blocks, etc.</i> ● <i>Addition and subtraction sentences are written using + and =. They are written horizontal and vertical.</i>

	<ul style="list-style-type: none"> Identifying key words and phrases in a word problem helps to find the operation to solve the problem (e.g. How many are left? – Subtraction; How many altogether? - addition).
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Standard Code #	NJ Student Learning Standards
1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.2
1.OA.2	Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.OA.7	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. <i>For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.</i>
1.OA.8	Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. <i>For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = \square - 3$, $6 + 6 = \square$.</i>
1.NBT.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Evidence of Learning

Summative Assessment

- Model Curriculum Unit Assessment
- Mid-Chapter check
- End of Chapter assessment
- Performance assessment

Formative Assessment

- Lesson check/spiral review
- Quick check

Instructional Materials and Resources

- Go Math series
- www.IXL.com
- www.abcya.com
- www.thinkcentral.com
- Manipulatives (connecting cubes, base ten blocks, MathBoards, flash cards)
- YouTube fact family video <https://www.youtube.com/watch?v=CsgOSrVnw-M>
- YouTube interactive math game <https://www.youtube.com/watch?v=n8LXNlbmrno>

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/1.shtml>
- <http://www.state.nj.us/education/cccs/standards/9/9.pdf>

Mathematics- Grade 1

Unit 3: Understanding Place Value

21st Century Themes

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

Creativity and Innovation

Critical Thinking and Problem Solving

Communication

Collaboration

Unit 3 Learning Targets

Students will be able to...

- *Construct, identify, and compare sets of numbers to 120*
- *Explore the use of ordinal numbers*
- *Record numbers using tally marks*
- *Skip count by 2's, 5's and 10's to 120 with and without manipulatives*
- *Identify, order and record numbers to 120*
- *Count forward to 120 and backwards from 20*
- *Investigate odd and even numbers*
- *Compare sets of numbers using vocabulary and signs (>, <, and =)*
- *Develop the concepts of place value for 2 digit numbers with the use of manipulatives*
- *Investigate the magnitude of 120 using manipulatives*
- *Write a 2 digit number in standard form*
- *Explore patterns in number sequences using manipulatives and a 100's (and 120's) chart*
- *Group by 10's to estimate*
- *Use benchmarks to estimate*
- *Estimate sets without counting*
- *Compare 2-digit numbers*
- *Add 2-digit numbers using multiples of 10*
- *Decompose 2-digit numbers into tens and ones*
- *Subtract multiples of ten from multiples of ten*

#	Student Learning Objectives	NJSL S	Learning Activity
1	Decompose two- digit numbers as the sum of tens and ones for numbers less than 100.	1.NBT.2c	<ul style="list-style-type: none"> ● Use a tens frame to show groups of tens and ones ● Write a journal entry explaining how to show a number as tens and ones ● Draw a picture to show tens and ones using a stick for 10 and circles for 1.
2	Compare two digit numbers using <, >, and = symbols.	1.NBT.3	<ul style="list-style-type: none"> ● Write a class story that compares 2 amounts of items

			<ul style="list-style-type: none"> ● Use a weighted balance to compare numbers ● Draw two groups of objects that have the same amount ● Use cubes to build models of numbers
3	Add a 2-digit and a 1-digit number, and a 2-digit number and a multiple of 10, using concrete models or drawings (sums within 50). Add tens and tens, and ones and ones, by decomposing 2-digit numbers and composing an additional ten when necessary (e.g., $18 + 20$ equals $10 + 8 + 20$ equals $30 + 8$ equals 38; and, $37 + 5$ equals $30 + 7 + 5$ equals $30 + 12$ equals $30 + 10 + 2$ equals $40 + 2$ equals 42).	1.NBT.4	<ul style="list-style-type: none"> ● Use connecting cubes to represent numbers ● Play Beat the Calculator ● Play interactive games to practice adding ● Write a “How To” paragraph about adding two digit numbers with models
4	Mentally find ten more or ten less than a number without having to count and explain the reasoning used.	1.NBT.5	<ul style="list-style-type: none"> ● Using index cards with different numbers students will work in pairs to determine 10 more or 10 less of a given number ● Have children arrange themselves to show a number
5	Subtract multiples of ten from multiples of ten (numbers less than 100, differences greater than or equal to zero) and explain the reasoning used.	1.NBT.6	<ul style="list-style-type: none"> ● Use a counting chart to subtract ● Use MathBoard to show solutions ● Write a word problem using groups of 10

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
SLO #1 Explain what it means to decompose a two-digit number into two parts (numbers less than 100).
SLO #3 Explain how to solve addition problems involving 1-digit numbers, 2-digit numbers, and multiples of 10.
2. Reason abstractly and quantitatively.
SLO #1 Understand the quantities that are represented in a two-digit decomposed number.
SLO #2 Understand the quantities of numbers and their relationship to each other in order to correctly apply the $<$, $>$, or $=$ symbols.
3. Construct viable arguments and critique the reasoning of others.
SLO #5 Accurately and efficiently explain the reasoning involved in subtracting multiples of ten from multiples of ten.
4. Model with mathematics.
5. Use appropriate tools strategically.
SLO #3 Be able to identify the proper tools to help model addition problems involving

1-digit numbers, 2-digit numbers, and multiples of 10.

6. Attend to precision.

SLO #2 State the meaning behind the $<$, $>$, and $=$ symbols, and apply the signs consistently and appropriately.

7. Look for and make use of structure.

SLO #1 Understand the pattern of decomposing numbers less than 100 (e.g. 82 is equal to 8 groups of 10 and two ones).

SLO #3 Understand the structure involved in adding 2-digit and 1 digit numbers, and 2-digit numbers and a multiple of 10 (include decomposing 2-digit numbers).

8. Look for and express regularity in repeated reasoning.

Unit 3 Essential Questions		Unit 3 Enduring Understandings	
<ul style="list-style-type: none"> • <i>How can numbers and sets be compared and ordered?</i> • <i>How are digits used to create numbers?</i> • <i>What are different ways to count?</i> • <i>Why not always count by 1?</i> • <i>How does a number hold its place?</i> • <i>How big is 100?</i> 		<ul style="list-style-type: none"> • <i>Numbers are used to represent quantities or order.</i> • <i>The base ten numbers are recorded using digits 0-9, groups of 10 and place value.</i> • <i>Numbers can be compared and related to other numbers and objects.</i> • <i>Numbers can be counted in a variety of ways (e.g., forward and backward).</i> • <i>Skip counting by 2, 5, and 10 assists students in counting quickly. It also assists students to make sense of real world situations.</i> • <i>A number holds its place using digits representing certain value (e.g. base ten blocks, ten frame).</i> • <i>Representations of 100 are made using counters, base ten blocks, ten frames, pictures.</i> 	
Standard Code #	NJ Student Learning Standards		
1.NBT.2c	Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).		
1.NBT.3	Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.		
1.NBT.4	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.		
1.NBT.5	Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.		
1.NBT.6	Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), 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 and explain the reasoning used.

Evidence of Learning

Summative Assessment

- Model Curriculum Unit Assessment
- Mid-Chapter Check
- End of Chapter Test
- Performance Assessment

Formative Assessment

- Lesson check/spiral review
- Quick check

Instructional Materials and Resources

- www.insidemathematics.org
- Go Math series
- www.IXL.com
- www.thinkcentral.com
- www.abcya.com
- Manipulatives (tens frame, counters, weighted balance, counting chart, connecting cubes, etc)
- www.crickweb.co.uk/ks2numeracy-calculation.html#ncmenu
- “How Much is a Million” by David Schwartz

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/1.shtml>
- <http://www.state.nj.us/education/cccs/standards/9/9.pdf>

Mathematics- Grade 1

Unit 4: Measurement and Shapes

21st Century Themes

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

Creativity and Innovation

Critical Thinking and Problem Solving

Communication

Collaboration

Unit 4 Learning Targets

Students will be able to...

- *Measure weight with nonstandard units*
- *Compare weights of objects using a balance scale*
- *Compare and order the length and weight of given objects through direct comparisons*
- *Measure length to the nearest inch*
- *Estimate, measure, and record using nonstandard and standard (inches) units of measurement*
- *Investigate rulers and scales as measuring tools*
- *Draw/ build shapes.*
- *Name the attributes of 2-dimensional shapes*
- *Order 3 objects by length*
- *Measure an object by using another object*

#	Student Learning Objectives	NJSLS	Learning Activity
1	Order three objects by lengths and compare the lengths of two objects by using the third object (e.g., if the crayon is shorter than the marker and the marker is shorter than the pencil then the crayon is shorter than pencil).	1.MD.1	<ul style="list-style-type: none"> ● Measure classroom objects of different lengths ● Compare 3 objects to determine which is longer/shorter ● Order 5 objects from longest to shortest
2	Use an object to measure another object's length by laying multiple copies end to end with no overlaps giving measurements in whole number units.	1.MD.2	<ul style="list-style-type: none"> ● Use paper clips or color tiles to measure the length of classroom objects ● Measure the same object with different nonstandard measuring tools
3	Tell and write time to the half-hour using "o'clock" and digital notation.	1.MD.3	<ul style="list-style-type: none"> ●
4	Name the attributes of a given two-dimensional shape (square,	1.G.1	<ul style="list-style-type: none"> ●

	triangle, rectangle, regular hexagon) distinguishing between defining and non-defining attributes.		
5	Draw and build shapes when given defining attributes (e.g., 3 sides, 4 sides, 3 corners, 4 corners).	1.G.1	•

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
 SLO #1 Use concrete objects to help order the lengths of multiple objects.
 SLO #7 Analyze the given information and the relationship among numbers in addition and subtraction problems in order to solve.
2. Reason abstractly and quantitatively.
 SLO #8 Know how to represent the quantity or set of objects with a written numeral of any number less than 120.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
 SLO #6 Apply previously learned mathematics to solve addition and subtraction word problems (within 20).
5. Use appropriate tools strategically.
 SLO #1 and #2 Consider and make use of available tools when comparing objects by length.
6. Attend to precision.
 SLO #2 Use precise and accurate measurements when measuring the lengths of objects.
7. Look for and make use of structure.
 SLO #7 Look for and discern patterns when solving addition and subtraction problems within 20 (e.g. adding two even numbers yields an even number, subtraction of two odd numbers yields an even number, or $3 + 7$ is equivalent to $7 + 3$).
8. Look for and express regularity in repeated reasoning.

Unit 4 Essential Questions

- *How do measurements help compare objects?*
- *How are standard and nonstandard units used to measure objects?*
- *How are measuring units/tools selected?*
- *How is estimation helpful in measurement?*
- *What are shapes and where are they found?*
- *Why do we measure objects?*
- *What strategies will students use to compare measurements?*

Unit 4 Enduring Understandings

- *Objects can be compared and ordered by length, weight.*
- *Objects have distinct attributes that can be measured with appropriate tools.*
- *Two-dimensional shapes are objects such as quadrilaterals, triangles, circles, and polygons that are found in our physical world.*
- *Measurement helps us to understand and describe the world such as how tall someone is, describing how heavy something is, or how much something holds.*
- *Standard and nonstandard units will be used to compare and order lengths.*

Standard Code #

NJ Student Learning Standards

1.MD.1

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1.MD.2

Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand

	that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. <i>Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.</i>
1.MD.3	Tell and write time in hours and half-hours using analog and digital clocks.
1.G.1	Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.
1.OA.1	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. ²
1.OA.6	Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).
1.NBT.1	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Evidence of Learning

Summative Assessment

- Model Curriculum Unit Assessment
-
-

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/1.shtml>
- <http://www.state.nj.us/education/cccs/standards/9/9.pdf>

Mathematics- Grade 1

Unit 5: Reasons with 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			
<i>Students will be able to...</i>			
<ul style="list-style-type: none"> ● <i>To measure weight with nonstandard units</i> ● <i>Compare weights of objects using a balance scale</i> ● <i>Compare and order the length and weight of given objects through direct comparisons</i> ● <i>Measure length to the nearest inch</i> ● <i>Estimate, measure, and record using nonstandard and standard (inches) units of measurement</i> ● <i>Investigate rulers and scales as measuring tools</i> ● <i>Add and subtract within 20 (fluently within 10)</i> ● <i>Use addition and subtraction within 20 to solve problems</i> ● <i>Partition circles and rectangles into halves and fourths</i> ● <i>Compose 2-dimensional and 3-dimensional shapes</i> ● <i>Create a composite shape and compose new shapes from the composite shape</i> ● <i>Organize, represent, and interpret data with up to 3-5 categories</i> 			
#	Student Learning Objectives	NJSL S	Learning Activity
1	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles and quarter circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.	1.G.2	●
2	Partition circles and rectangles into two or four equal shares, describing the shares using halves, fourths, and, quarters, and use the phrases half of, fourth of, and quarter of.	1.G.3	●
3	Describe the whole circle (or rectangle) partitioned into two or four equal shares as "two of", or "four of" the shares.	1.G.3	●
4	Add within 100, including adding a two-digit and a one-digit number, and adding a two-digit number and a multiple of 10; using concrete models, or drawings and strategies based on place value, properties of operations and/or the relationship between addition and subtraction; and relate the strategy to a written method and explain the reasoning	1.NBT.4	●

	used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.		
5	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.	1.OA.1	•
6	Add and subtract within 20 (fluently within 10). Use strategies such as: counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent sums (e.g., adding $6 + 7$ by creating the known equivalents $6 + 6 + 1 = 12 + 1 = 13$).	1. OA.6	•
7	Organize, represent, and interpret, data with up to three categories, and compare the number counts of data points among the categories, e.g., equal to, more than, or less than another category.	1.MD.4	•

Selected Opportunities for Connection to Mathematical Practices

1. Make sense of problems and persevere in solving them.
 - SLO #1 Use concrete component objects to help conceptualize and form two and three-dimensional shapes.
 - SLO #2 Understand the relationship of the whole to its parts when dividing shapes into equal shares
 - SLO #4 Explain the steps involved and how to solve an addition problem (within 100).
2. Reason abstractly and quantitatively.
 - SLO #2 Understand and make sense of the quantities of the whole and its equal shares.
 - SLO # 5 Understand and make sense of the quantities and how they relate to solving an addition or subtraction word problem.
 - SLO # 6 Understand and make sense of the relationship between addition and subtraction and the quantities involved in equation.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
 - SLO #5 Apply previously learned mathematics skills to solve addition and subtraction word problems.

5. Use appropriate tools strategically.
 SLO #1 Use available and appropriate tools when composing new two and three-dimensional shapes.
 SLO #4 Utilize appropriate tools when using diagrams or concrete models to add within 100.
6. Attend to precision.
 SLO #2 Use clear and precise mathematical language to explain and describe dividing shapes into equal shares.
 SLO #3 Use clear and precise mathematical language to explain and describe parts of a whole.
 SLO #4 Use clear and precise language when explaining how to add within 100, which might include reasoning based on place value, properties of operations, or the relationship between addition and subtraction.
7. Look for and make use of structure.
 SLO #4 Understand the pattern when adding within 100.
 SLO #6 Understand the relationship between addition and subtraction.
8. Look for and express regularity in repeated reasoning.

Unit 5 Essential Questions	Unit 5 Enduring Understandings
<ul style="list-style-type: none"> • <i>What questions can be answered by a data representation?</i> • <i>What kinds of questions can generate data? • How are solid figures used to build our world?</i> 	<ul style="list-style-type: none"> • <i>People use graphs and charts to communicate information and learn about a class or community, such as favorite color of a class.</i> • <i>Multiple questions can be answered using different data representations.</i> • <i>Many objects in our world can be described as geometric shapes and relationships.</i>

Standard Code #	NJ Student Learning Standards
1.G.2	Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles and quarter circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.
1.G.3	Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more shares creates smaller shares.
1.NBT.4	Add within 100, including adding a two-digit and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.
1.OA.1	Add and subtract numbers within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and

	creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalents $6 + 6 + 1 = 12 + 1 = 13$).
1. OA.6	Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.
1.MD.4	Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, e.g., how many in each category, and how many more or less are in one category than in another.

Evidence of Learning

Summative Assessment

- Model Curriculum Unit Assessment
-
-

Formative Assessment

-
-
-

Instructional Materials and Resources

-
-

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/1.shtml>
- <http://www.state.nj.us/education/cccs/standards/9/9.pdf>

NJ Student Learning Standards for Mathematics Grade 1

Operations & Algebraic Thinking

Standards in this domain

[NJSLS.MATH.CONTENT.1.OA.A.1](#)

[NJSLS.MATH.CONTENT.1.OA.A.2](#)

[NJSLS.MATH.CONTENT.1.OA.B.3](#)

[NJSLS.MATH.CONTENT.1.OA.B.4](#)

[NJSLS.MATH.CONTENT.1.OA.C.5](#)

[NJSLS.MATH.CONTENT.1.OA.C.6](#)

[NJSLS.MATH.CONTENT.1.OA.D.7](#)

[NJSLS.MATH.CONTENT.1.OA.D.8](#)

Represent and solve problems involving addition and subtraction.

[1.OA.A.1](#)

Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.¹

[1.OA.A.2](#)

Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.

Understand and apply properties of operations and the relationship between addition and subtraction.

[1.OA.B.3](#)

Apply properties of operations as strategies to add and subtract.² *Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)*

[1.OA.B.4](#)

Understand subtraction as an unknown-addend problem. *For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.*

Add and subtract within 20.

[1.OA.C.5](#)

Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).

[1.OA.C.6](#)

Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a

number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).

Work with addition and subtraction equations.

1.OA.D.7

Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.

1.OA.D.8

Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.*

¹ See Glossary, Table 1

² Students need not use formal terms for these properties.

Number & Operations in Base Ten

Standards in this domain

[NJSLs.MATH.CONTENT.1.NBT.A.1](#)

[NJSLs.MATH.CONTENT.1.NBT.B.2](#)

[NJSLs.MATH.CONTENT.1.NBT.B.3](#)

[NJSLs.MATH.CONTENT.1.NBT.C.4](#)

[NJSLs.MATH.CONTENT.1.NBT.C.5](#)

[NJSLs.MATH.CONTENT.1.NBT.C.6](#)

Extend the counting sequence.

1.NBT.A.1

Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Understand place value.

1.NBT.B.2

Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases:

- 10 can be thought of as a bundle of ten ones — called a "ten."
- The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones.
- The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).

1.NBT.B.3

Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.

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

1.NBT.C.4

Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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 and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.

1.NBT.C.5

Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.

1.NBT.C.6

Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), 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 and explain the reasoning used.

Measurement & Data

Standards in this domain

[NJSLs.MATH.CONTENT.1.MD.A.1](#)

[NJSLs.MATH.CONTENT.1.MD.A.2](#)

[NJSLs.MATH.CONTENT.1.MD.B.3](#)

[NJSLs.MATH.CONTENT.1.MD.C.4](#)

Measure lengths indirectly and by iterating length units.

1.MD.A.1

Order three objects by length; compare the lengths of two objects indirectly by using a third object.

1.MD.A.2

Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

Tell and write time.

1.MD.B.3

Tell and write time in hours and half-hours using analog and digital clocks.

Represent and interpret data.

1.MD.C.4

Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

Geometry

Standards in this domain

[NJSLs.MATH.CONTENT.1.G.A.1](#)

[NJSLs.MATH.CONTENT.1.G.A.2](#)

[NJSLs.MATH.CONTENT.1.G.A.3](#)

Reason with shapes and their attributes.

1.G.A.1

Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.

1.G.A.2

Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.¹

1.G.A.3

Partition circles and rectangles into two and four equal shares, describe the shares using the words *halves*, *fourths*, and *quarters*, and use the phrases *half of*, *fourth of*, and *quarter of*. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.

¹ Students should apply the principle of transitivity of measurement to make indirect comparisons, but they need not use this technical term.