North Caldwell Mathematics

Grade Level: 1

Contents

Instructional Materials

Everyday Mathematics 4th Edition
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Supplemental Resources

- Connected Ed https://connected.mcgraw-hill.com/connected/login.do
- Illustrative Mathematics https://www.illustrativemathematics.org/
- Khan Academy https://www.khanacademy.org/
- Math for Elementary School Teachers http://www.mathforelementaryteachers.org/ video clips that contain explanations of arithmetic topics including: Place Value/Arithmetic Models/Arithmetic Algorithms, Mental Math, Primes/Divisibility, Fraction Arithmetic, and Word Problems/Model Drawing.
- National Council of Teachers of Mathematics http://www.nctm.org/
- National Library of Virtual Manipulatives http://nlvm.usu.edu/
- NCTM Illuminations Resources for Teaching Math http://illuminations.nctm.org/

Interdisciplinary Connections

Mathematics is a unified body of knowledge whose concepts build upon each other. Connecting mathematical concepts includes linking ideas to related ideas learned previously.

Major emphasis should be given to ideas and concepts across mathematical content areas that help students see that mathematics is a web of closely connected ideas. Students need to connect their mathematical learning to appropriate real-world contexts. They need to create interest and maintain the interest after the novelty of the work has worn off.

Mathematics is the language of science and is greatly utilized in industry and business. It gives us the power to solve difficult real-world problems, but also helps us to understand how the universe operates.

Every mathematics teacher needs to make students unafraid of the subject by convincing the students of the usefulness of learning mathematics in their daily lives and for higher studies. The world today, which leans more and more heavily on Science and Technology, demands more from mathematics. Tomorrow's world will, no doubt, make still greater demands from mathematics.

Interdisciplinary Connections for Grade 1

"Pumpkin Math"

-Introduce with *How Many Seeds in a Pumpkin* (skills covered- skip counting, addition, estimating)

-Pumpkin Packet

Record Estimate & Actual

- Weight
- Inches around
- Number of Seeds
- Sink or Float
- Describing Words (adjectives)
- Illustration

"10 Fat Turkeys"

-Introduce with *10 Fat Turkeys* (skills covered- counting forward & backward, complements of 10)

-Record Complements of 10 on individual feathers

(reference illustrations- How many turkeys are on the fence? (6) How many are off? (4)
What do you know about 6 and 4? (=10)

-Create "This turkey is a 10!" project with feathers and other copy patterns

"Seeing Double"

-Read *Two of Everything*

-Comprehension Questions

-What was special about the pot that Mr. Haktak found? (everything he put in was doubled)
-What happened when Mr. Haktak fell into the pot? (2 Mr. Haktak's came out)
-What happened when Mr. & Mrs. Haktak put 5 coins in? (10 came out)

-After understanding is confirmed, write equations to show what happened in the text

(1+1=2, 5+5=10)

-Introduce "doubling machine" (mirror) and model & play "Seeing Double" activity

-After students have rolled die and held that number of items in the mirror the see it doubled, they can write one equation and create a drawing representation on the "Doubling Pot" activity sheet.

-Present work & display class book

Interdisciplinary Connections (continued)

"Lifetime: The Amazing Numbers in Animal Lives"

-The story is set up in a style where every page states something along the lines of, "In one lifetime caribou grow and shed 10 sets of antlers."

-Note that each illustration matches the numbers stated in the text.

-Language Arts charting

Noun	Adjective/Noun	Verb
Spider	papery egg sac	spin
Caribou	strong antlers	grow, shed

Charting Numerals

Numeral	Word
1	one
10	ten

New Jersey Student Learning Standards (NJSLS)

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.

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

Operations and Algebraic Thinking

Represent and solve problems involving addition and subtraction.

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.

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.

Understandings	Essential Questions
Students will understand that: • addition involves adding to and putting together. • subtraction involves taking from, taking apart, and comparing. • missing numbers in a math sentence can be found using addition and subtraction. • a symbol can represent an unknown. • objects, drawings, and equations can be used to solve problems.	• How can one find the total of parts? • How can one find the missing part of a whole?
Knowledge	**Skills**
Students will know… • the meaning of addition. • the meaning of subtraction. • there are multiple interpretations of addition and subtraction.	Students will be able to… • add on to a group in order to find a total amount. • solve problems as part-part-whole problems when joining or putting them together. • use subtraction to determine how many more are in one group than another (comparing). • solve word problems that call for the addition of three whole numbers whose sum is less than 20. • use objects and drawings to represent problems. • use equations with a symbol for the unknown number to represent the problem.

RESOURCES

- **Everyday Mathematics 4 Routines** 1, 2, 3, 6; **Lessons** 1-5, 1-10, 2-1, 2-3, 2-4, 2-8, 2-9, 2-10, 2-11, 3-1, 3-2, 3-3, 3-4, 3-6, 3-8, 4-1, 4-2, 4-4, 4-6, 4-9, 4-10, 4-11, 5-3, 5-9, 5-10, 5-11, 5-12, 6-1, 6-2, 6-4, 6-5, 6-7, 6-8, 6-10, 6-11, 7-1, 7-3, 7-6, 7-7, 7-9, 8-7, 8-11, 9-2, 9-4, 9-5, 9-6, 9-7 (2-2, 2-12, 3-3, 4-5, 4-7, 4-10, 5-1, 5-2, 5-4, 5-5, 5-6, 5-7, 5-9, 5-10, 6-1, 6-2, 6-3, 6-5, 6-6, 6-9, 6-11, 7-4, 7-9, 7-10, 7-11, 8-1, 8-3, 8-8, 8-11)
- **Supplemental Lessons**: Binder pages 1-6, 16-48

Operations and Algebraic Thinking

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

1.OA.3 Apply properties of operations as strategies to add and subtract. *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.) (Students need not use formal terms for these properties.)*

1.OA.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.*

Understandings	Essential Questions
Students will understand that: • properties of operations are used as strategies for solving addition and subtraction problems. • knowing how addition and subtraction are related helps us to solve math problems.	• What is the relationship between addition and subtraction? • How can properties of operations help to solve addition and subtraction problems?
Knowledge	**Skills**
Students will know… • the properties of operations (but will not use formal terms for these properties.)	Students will be able to… • apply the properties of operations to solve problems involving addition and subtraction. • solve a subtraction problem by making it an unknown-addend problem.

RESOURCES

- **Everyday Mathematics 4 Routines**: 3, 5, 6; **Lessons** 1-10, 2-1, 2-4, 2-5, 2-9, 3-5, 3-6, 3-7, 3-8, 3-10, 4-8, 4-9, 4-10, 5-6, 5-7, 5-9, 5-10, 6-2, 6-3, 6-4, 6-6, 6-7, 6-9, 6-11, 7-1, 7-2, 7-3, 7-4, 7-6, 7-7, 7-8, 7-11, 8-1, 8-2, 8-6, 9-7, 9-8 (2-7, 2-9, 2-10, 2-11, 3-2, 3-3, 3-9, 3-11, 3-12, 4-1, 4-2, 4-3, 4-5, 4-9, 4-11, 5-2, 5-4, 5-5, 5-8, 5-11, 5-13, 6-1, 6-4, 6-6, 6-7, 6-8, 6-10, 6-11, 6-12, 7-5, 7-7, 7-9, 7-10, 7-11, 8-3, 8-4, 8-8, 8-11, 9-4, 9-10)
- **Supplemental Lessons**: Binder pages 16-48

Operations and Algebraic Thinking

Add and subtract within 20.

1.OA.5 Relate counting to addition and subtraction (e.g., by counting on 2 to add 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).

Understandings	Essential Questions
Students will understand that: • there are multiple strategies to add and subtract. • counting is related to addition and subtraction. • how many or how much there is of something increases with addition and decreases with subtraction.	• How is counting related to addition and subtraction? • How can a problem be simplified? • What strategies are available to determine how much or how many we have?
Knowledge	**Skills**
Students will know… • numbers that make 10 will help solve problems. • numbers can be decomposed into simpler terms. • counting on strategies. • "making 10" strategies. • "decomposing 10" strategies. • the inverse relationship between addition and subtraction. • solutions can be found by forming equivalent but easier or known sums.	Students will be able to… • add within 20. • subtract within 20. • fluently add within 10. • fluently subtract within 10. • count on to add. • decompose a number leading to 10.

RESOURCES

- **Everyday Mathematics 4 Routines**: 1, 2, 3, 4, 5, 6; **Lessons** 1-1, 1-3, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 2-8, 2-9, 2-10, 2-11, 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9, 3-10, 3-11, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 5-1, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9, 5-10, 5-11, 5-12, 6-1, 6-2, 6-3, 6-4, 6-5, 6-6, 6-7, 6-8, 6-9, 6-10, 6-11, 7-1, 7-2, 7-3, 7-4, 7-6, 7-7, 7-8, 7-9, 7-10, 7-11, 8-1, 8-2, 8-3, 8-6, 8-7, 8-9, 9-1, 9-4, 9-6, 9-7, 9-8, 9-11 (2-4, 2-7, 2-12, 3-1, 3-4, 3-11, 3-12, 4-2, 4-3, 4-4, 4-5, 4-6, 4-10, 4-12, 5-1, 5-2, 5-3, 5-6, 5-7, 5-8, 5-9, 5-11, 5-13, 6-4, 6-12, 7-5, 7-10, 8-4, 8-5, 8-8, 8-10, 8-11, 9-3, 9-9)
- **Supplemental Lessons**: Binder pages 1-7,16-48

Operations and Algebraic Thinking

Work with addition and subtraction equations.

1.OA.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.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 = _.*

Understandings	Essential Questions
Students will understand that: • the equal sign represents two sides that are balanced and have equivalent expressions on each side. • an equation is true if the representation on the left side of the equal sign is equivalent to the representation on the right side of the equal sign; otherwise it is false. • if an unknown number must be found, it must make the equation true.	• How can one determine if an equation is true or false? • When the unknown number is found for an equation, how can one tell if it is correct?
Knowledge	**Skills**
Students will know… • an equation is true only if the left and right sides of an equal sign have equivalent expressions. • that an unknown represents a number that will make an equation true.	Students will be able to… • determine if an equation is true or false. • determine the value of an unknown which will make the equation true. • relate three numbers to each other through the use of an equation.

RESOURCES

- **Everyday Mathematics 4 Lessons** 2-8, 2-9, 2-10, 2-11, 3-1, 3-2, 3-4, 3-7, 3-8, 3-9, 3-10, 4-2, 4-4, 4-6, 5-4, 5-5, 5-6, 5-7, 5-9, 5-10, 6-3, 6-4, 6-9, 7-1, 7-2, 7-3, 7-4, 7-8, 7-9, 7-10, 8-1, 8-2, 8-3, 8-9, 8-11, 9-6, 9-8 (3-5, 4-1, 4-3, 4-7, 4-9, 4-10, 4-11, 4-12, 5-4, 5-6, 5-11, 5-12, 5-13, 6-4, 6-5, 6-6, 6-7, 6-8, 6-10, 6-11, 6-12, 7-1, 7-3, 7-4, 7-5, 7-7, 7-11, 8-1, 8-5, 8-6, 8-7, 8-8, 8-9, 8-10, 8-12, 9-1, 9-3, 9-6, 9-9, 9-12)

Number and Operations in Base Ten

Extend the counting sequence.

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.

Understandings	Essential Questions
Students will understand that: • counting involves patterns.	• How does where the digits are located affect how one reads the number? • How do counting patterns help one to count?
Knowledge	**Skills**
Students will know… • counting patterns. • how to read a number in the hundreds, tens, and ones place (for example, in 88 the 8 in the tens place is read as eighty whereas the 8 in the ones place is read as eight.)	Students will be able to… • count to 120, starting at any number less than 120. • read numerals from 0 to 120. • write numerals from 0 to 120. • represent a number of objects with a written numeral, up to 120.

RESOURCES

- **Everyday Mathematics 4 Routines** 1, 2, 3, 4, 5, 6; **Lessons** 1-, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 2-1, 2-2, 2-3, 2-4, 2-5, 2-7, 2-10, 2-11, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9, 3-10, 3-11, 4-1, 4-3, 4-4, 4-5, 4-7, 4-11, 5-2, 5-3, 5-4, 5-6 (2-6, 2-8, 2-9, 2-12, 3-1, 3-12, 4-2, 4-6, 4-8, 4-10, 4-12, 5-10, 5-13)
- **Supplemental Lessons**: Binder pages 1-7

Number and Operations in Base Ten

Understand place value.

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:

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.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 <.

Understandings	Essential Questions
Students will understand that: • the location of digits in a number determines the value of the number. • to compare two numbers, one must compare the digits in each place, starting with the tens place.	• Why is place value important?
Knowledge	**Skills**
Students will know… • the representation of 1 – 9 as ones; 11 – 19 as a composition of one ten plus ones. • the two digits in a two-digit number represent the amount of tens and 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).	Students will be able to… • identify ten as ten ones bundled. • identify tens and ones in a two-digit number. • compare two digit numbers using <, =, and >.

RESOURCES

- **Everyday Mathematics 4 Routines** 1, 2, 3, 5; **Lessons** 1-2, 1-3, 1-5, 1-6, 1-7, 1-8, 1-11, 2-1, 2-2, 2-6, 2-8, 2-10, 3-1, 3-3, 4-2, 4-3, 4-5, 4-7, 4-8, 4-11, 5-1, 5-2, 5-3, 5-4, 5-5, 5-6, 5-7, 5-8, 5-9, 5-11, 6-2, 6-6, 6-8, 6-9, 6-10, 6-11, 7-1, 7-2, 7-4, 7-7, 8-6, 8-8, 8-910, 8-11, 9-2, 9-3, 9-5, 9-8, 9-9 (3-6, 3-7, 3-10, 4-8, 4-10, 4-12, 5-13, 6-2, 6-3, 6-4, 6-5, 6-7, 6-9, 6-10, 7-1, 7-3, 7-4, 7-5, 7-6, 7-8, 7-9, 7-10, 7-11, 7-12, 8-1, 8-2, 8-3, 8-4, 8-7, 8-8, 8-12, 9-1, 9-4, 9-5, 9-7, 9-8, 9-9, 9-10, 9-12)
- **Supplemental Lessons**: Binder pages 1-7

Number and Operations in Base Ten

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

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 (e.g., base-ten blocks) 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.

Understandings	Essential Questions
Students will understand that: • concrete models, drawings, strategies based on place value, properties of operations, and/or the relationship between addition and subtraction can help one solve problems. • when adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. • when subtracting multiples of 10 from multiples of 10, one subtracts tens from tens and knows that 0 remains in the ones place.	• How does place value help one find the answers to addition and subtraction problems?
Knowledge	**Skills**
Students will know… • properties of operations to add and subtract. • the values of digits in a two-digit number.	Students will be able to… • add a two-digit number and a one-digit number, with a sum within 100. • add a two-digit number and a multiple of ten, with a sum within 100. • given a two-digit number, mentally find 10 more or 10 less than the number, without having to count. • subtract multiples of 10 in the range 10 – 90, from multiples of 10 in the range 10 – 90 (positive or 0 differences). • relate a strategy to a written method. • explain the reasoning used for a given strategy.

RESOURCES

- **Everyday Mathematics 4 Routines** 1, 2, 3, 5; **Lessons** 4-11, 5-11, 6-1, 6-2, 6-7, 6-8, 6-9, 7-1, 7-5, 7-8, 7-9, 7-10, 8-2, 8-4, 8-5, 8-7, 8-10, 8-11, 9-1, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7, 9-8, 9-9, 9-11 (4-8, 4-12, 5-2, 5-5, 5-10, 5-13, 6-3, 6-4, 6-5, 6-6, 6-7, 6-10, 6-11, 6-12, 7-1, 7-2, 7-3, 7-4, 7-6, 7-10, 7-11, 7-12, 8-1, 8-5, 8-6, 8-7, 8-8, 8-10, 8-12, 9-1, 9-4, 9-6, 9-9, 9-10, 9-11, 9-12)

Measurement and Data

Measure lengths indirectly and by iterating length units.

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. *Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.*

Understandings	Essential Questions
Students will understand that: • lengths of objects can be compared to lengths of other objects. • measurement is an iteration of same-size units.	• How do we measure the length of an object? • How do we compare the lengths of two objects?
Knowledge	**Skills**
Students will know… • the units used to measure an object should not overlap. • the units used to measure an object should not have gaps between them. • the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.	Students will be able to… • order three objects by length. • compare the lengths of two objects indirectly by using a third object. • express the length of an object as a whole number of length units.

RESOURCES

- **Everyday Mathematics 4 Lessons** 3-3, 3-11, 4-1, 4-2, 4-3, 4-4, 4-5, 4-9, 5-3, 5-7, 5-8, 9-1 (3-12, 4-8, 4-11, 4-12, 5-1, 5-3, 5-6, 5-11, 6-1, 6-2, 6-3, 6-7, 6-10, 7-1, 7-2, 7-5, 8-1, 8-3, 9-8, 9-11)
- **Supplemental Lessons**: Binder pages 9-15

Measurement and Data

Tell and write time.

1.MD.3 Tell and write time in hours and half-hours using analog and digital clocks.

Understandings	Essential Questions
Students will understand that: • when time passes, the hour hand and the minute hand move at different rates.	• How do the positions of the hands on an analog clock indicate the time? • How do the numbers on a digital clock indicate the time?
Knowledge	**Skills**
Students will know… • on an analog clock, the difference between the hour hand and the minute hand. • on an analog clock, on the hour, the hour hand is pointing exactly to the number that represents the hour; on the half-hour, the hour hand is pointing exactly half-way between two numbers. • on a digital clock, the digits to the left of the colon represent the hour and the digits to the right of the colon represent the minutes.	Students will be able to… • tell and write time in hours using an analog clock. • tell and write time in hours using a digital clock. • tell and write time in half-hours using an analog clock. • tell and write time in half-hours using a digital clock.

RESOURCES

- **Everyday Mathematics 4 Routine** 6; **Lessons** 6-1, 6-5, 6-7, 7-11, 8-1, 8-3, 8-8, 8-9, 9-1, 9-4, 9-9, 9-10 (5-9, 5-12, 6-2, 6-8, 6-12, 7-1, 7-3, 7-5, 7-9, 8-4, 8-6, 8-7, 8-10, 9-2, 9-7)
- **Supplemental Lessons**: Binder pages 49-51

Measurement and Data

Represent and interpret data.

1.MD.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.

Understandings	Essential Questions
Students will understand that: • there are many ways to analyze data.	• How can representing data help us to interpret it and draw conclusions?
Knowledge	**Skills**
Students will know… • the total number of data points will be represented in two or more categories.	Students will be able to… • organize data with up to three categories. • represent data with up to three categories. • interpret data with up to three categories. • compare the number of data points in two categories.

RESOURCES

- **Everyday Mathematics 4 Routines** 3, 4, 6; **Lessons** 1-7, 1-8, 2-2, 2-4, 4-5, 4-6, 8-3, 8-6, 8-9 (2-6, 3-7, 3-9, 3-10, 3-11, 5-2, 5-4, 5-5, 5-7, 5-8, 5-12, 6-1, 6-3, 7-1, 7-3, 7-4, 8-11)
- **Supplemental Lessons**: Binder page 7

Geometry

Reason with shapes and their attributes.

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.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 equal shares creates smaller shares.

Understandings	Essential Questions
Students will understand that: • attributes may or may not define a shape. • new shapes can be made from two or more other shapes. • compositions must be within the same dimension. • shares of a whole must always be equal. • decomposing into more equal shares creates smaller shares.	• Why do we need to identify shapes? • Why would we compose or decompose shapes?
Knowledge	**Skills**
Students will know… • shapes are characterized by their defining attributes (number of sides, size of angles, etc.). • non-defining attributes (color, overall size, orientation, etc.) give additional information but do not characterize the shape.	Students will be able to… • distinguish between defining and non-defining attributes. • build and draw shapes to possess defining attributes. • compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) to create a composite shape. • compose three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders)* to create a composite shape. • partition circles into two and four equal shares. • partition rectangles into two and four equal shares. • appropriately use the words *halves*, *fourths* and *quarters* and the phrases *half of*, *fourth of*, and *quarter of*. • describe the whole as two of, or four of the shares. *Students do not need to learn formal names.

RESOURCES

- **Everyday Mathematics 4 Lessons** 1-1, 1-3, 1-9, 4-5, 6-3, 7-5 to 7-7, 8-1 to 8-8, 8-10, 9-4, 9-5, 9-10, 9-11 (3-7, 3-10, 6-3, 6-8, 6-12, 7-8, 7-12, 8-2 to 8-4, 8-7 to 8-12, 9-1 to 9-12)

Additional Lessons for Grade 1

Although not required in the standards, students need to be exposed to additional content in order to prepare for what is required in future grades. In Grade 1 this includes money.

Understandings	Essential Questions
Students will understand that: • different coins have unique values. • the relative sizes of the coins are not related to the relative values of the coins (i.e., a penny is larger than a dime but it is not worth more than a dime.) • some coins can be exchanged for other coins, e.g., 5 pennies can be exchanged for 1 nickel. • the value of some coins and bills can be represented by a combination of other coins. • money amounts can be counted and compared. • coins can be identified by their color, size, and edge.	• Why do we need money? • How do we count money?
Knowledge	**Skills**
Students will know… • pennies are copper and nickels, dimes, and quarters are silver. • a nickel is bigger than a dime but smaller than a quarter. • pennies and nickels have a smooth edge while dimes and quarters have an edge with ridges.	Students will be able to… • identify a penny, nickel, dime, quarter, and dollar bill. • sort coins. • identify the value of a penny, nickel, dime, quarter and dollar bill. • skip count to count money. • compare value of set of coins or money amounts.

RESOURCES

- **Supplemental Lessons**: Binder pages 52-81

Connecting the Standards for Mathematical Content to the Standards for Mathematical Practice

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards, which set an expectation of understanding, are potential "points of intersection" between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Standards for Mathematical Practice

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

1. Make sense of problems and persevere in solving them.

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

2. Reason abstractly and quantitatively.

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

3. Construct viable arguments and critique the reasoning of others.

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

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

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

6. Attend to precision.

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

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well-remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

8. Look for and express regularity in repeated reasoning.

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

Standard 9
21st Century Life and Careers

In today's global economy, students need to be lifelong learners who have the knowledge and skills to adapt to an evolving workplace and world. To address these demands, Standard 9, 21st Century Life and Careers, which includes the 12 Career Ready Practices, establishes clear guidelines for what students need to know and be able to do in order to be successful in their future careers and to achieve financial independence.

Mission: *21st century life and career skills enable students to make informed decisions that prepare them to engage as active citizens in a dynamic global society and to successfully meet the challenges and opportunities of the 21st century global workplace.*

Vision: To integrate 21st Century life and career skills across the K-12 curriculum and in Career and Technical Education (CTE) programs to foster a population that:

- Continually self-reflects and seeks to improve the essential life and career practices that lead to success.
- Uses effective communication and collaboration skills and resources to interact with a global society.
- Is financially literate and financially responsible at home and in the broader community.
- Is knowledgeable about careers and can plan, execute, and alter career goals in response to changing societal and economic conditions.
- Seeks to attain skill and content mastery to achieve success in a chosen career path.

The Standards: Standard 9 is composed of the Career Ready Practices and Standard 9.1, 9.2, and 9.3 which are outlined below:

- **The 12 Career Ready Practices**
  These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness.
- **9.1 Personal Financial Literacy**
  This standard outlines the important fiscal knowledge, habits, and skills that must be mastered in order for students to make informed decisions about personal finance. Financial literacy is an integral component of a student's college and career readiness, enabling students to achieve fulfilling, financially-secure, and successful careers.
- **9.2 Career Awareness, Exploration, and Preparation**
  This standard outlines the importance of being knowledgeable about one's interests and talents, and being well informed about postsecondary and career options, career planning, and career requirements.
- **9.3 Career and Technical Education**
  This standard outlines what students should know and be able to do upon completion of a CTE Program of Study.

For students to be college and career ready they must have opportunities to understand career concepts and financial literacy. This includes helping students make informed decisions about their future personal, educational, work, and financial goals. By integrating Standard 9 into instruction, New Jersey students will acquire the necessary academic and life skills to not only achieve individual success but also to contribute to the success of our society.

21st Century Themes

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP3. Attend to personal health and financial well-being.

CRP4. Communicate clearly and effectively and with reason.

CRP5. Consider the environmental, social and economic impacts of decisions.

CRP6. Demonstrate creativity and innovation.

CRP7. Employ valid and reliable research strategies.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

CRP9. Model integrity, ethical leadership and effective management.

CRP10. Plan education and career paths aligned to personal goals.

CRP11. Use technology to enhance productivity.

CRP12. Work productively in teams while using cultural global competence.

CRP1. **Act as a responsible and contributing citizen and employee**
Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

CRP2. Apply appropriate academic and technical skills.
Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation

CRP3. Attend to personal health and financial well-being.
Career-ready individuals understand the relationship between personal health, workplace performance and personal well-being; they act on that understanding to regularly practice healthy diet, exercise and mental health activities. Career-ready individuals also take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.

CRP4. Communicate clearly and effectively and with reason.
Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CRP5. Consider the environmental, social and economic impacts of decisions.
Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment and the profitability of the organization.

CRP6. Demonstrate creativity and innovation.
Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

CRP7. Employ valid and reliable research strategies.
Career-ready individuals are discerning in accepting and using new information to make decisions, change practices or inform strategies. They use reliable research process to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.

CRP9. Model integrity, ethical leadership and effective management.
Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' action, attitudes and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals and organizational culture.

CRP10. Plan education and career paths aligned to personal goals.
Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.

CRP11. Use technology to enhance productivity.
Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.

CRP12. Work productively in teams while using cultural global competence.
Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural difference to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.

Differentiation Strategies

Students with Disabilities/ Students at Risk of School Failure

(For students with disabilities, appropriate accommodations, instructional adaptations, and/or modifications should be determined by the IEP or 504 team)

Modifications for Classroom

- Pair visual prompts with verbal presentations
- Ask students to restate information, directions, and assignments.
- Give repetition and practice exercises
- Model skills/techniques to be mastered
- Give extended time to complete class work
- Provide copy of class notes
- Determine if preferential seating would be beneficial
- Provide access to a computer
- Provide copies of textbooks for home
- Provide access to books on tape/CD/digital media, as available and appropriate
- Assign a peer helper in the class setting
- Provide oral reminders and check student work during independent work time
- Assist student with long and short term planning of assignments
- Encourage student to proofread assignments and tests
- Provide regular parent/school communication

Modifications for Homework and Assignments

- Provide extended time to complete assignments
- Break down assignments
- Provide the student with clearly stated (written) expectations and grading criteria for assignments
- Implement RAFT activities as they pertain to the types/modes of communication (role, audience, format, topic)

Modifications for Assessments

- Provide extended time on classroom tests and quizzes
- Provide alternate setting as needed
- Restate, reread, and clarify directions/questions
- Distribute study guide for classroom tests
- Establish procedures for accommodations /modifications for assessments

Differentiation Strategies

Gifted and Talented

(content, process, product and learning environment)

- Allow students to pursue independent projects based on their individual interests
- Provide enrichment activities that include more advanced material
- Allow team-teaching opportunities and collaboration
- Set individual goals
- Conduct research and provide presentation of appropriate topics
- Design surveys to generate and analyze data to be used in discussion.
- Use Higher-Level Questioning Techniques
- Provide assessments at a higher level of thinking

English Language Learners

Modifications for Classroom

- Pair visual prompts with verbal presentations
- Provide repetition and practice
- Model skills/techniques to be mastered

Modifications for Homework/Assignments

- Provide Native Language Translation (peer, online assistive technology, translation device, bilingual dictionary)
- Provide extended time for assignment completion as needed
- Highlight key vocabulary
- Use graphic organizers