Core Content Connectors by Common Core State Standards: Mathematics, Kindergarten

MSAA Instructional Resource Guide, Revised June 2024 from the NCSC content developed as part of the National Center and State Collaborative under a grant from the US Department of Education.

This view is designed to mirror the Common Core document while also including the CCCs linked to each CCSS.

Grade K Overview

Counting and Cardinality

- Know number names and the count sequence.
- Count to tell the number of objects.
- Compare numbers.

Operations and Algebraic Thinking

- Understand addition and putting together and adding to and understand subtraction as taking apart.

Number and Operations in Base Ten

- Work with numbers 11-19 to gain foundations for place value.

Measurement and Data

- Describe and compare measurable attributes.
- Classify objects and count the number of objects in categories.

Geometry

- Identify and describe shapes.
- Analyze, compare, create, and compose shapes.

Counting and Cardinality—K.CC

Know number names and the count sequence.

K.CC.A.1 Count to 100 by ones and by tens.

CCCs linked to K.CC.A.1

- K.NO.1a1 Rote count up to 10.
- K.NO.1a2 Rote count up to 31.
- K.NO.1a3 Rote count up to 100.
- 1.NO.1a5 Rote count up to 31.
- 1.NO.1a6 Rote count up to 100.
- 2.NO.1a9 Rote count up to 100.

K.CC.A.2 Count forward beginning from a given number withing the known sequence (instead of having to begin at 1).

CCCs linked to K.CC.A.2

1.NO.1a7 Count forward beginning from any given number below 10.

K.CC.A.3 Write numbers from 0-20. Represent a number of objects with a written numeral 0-20 (with 0 represented a count of no objects).

CCCs linked to K.CC.A.3

- K.NO.1d1 Identify numerals 1-10.
- K.NO.1d2 Identify numbers 1-10 when presented the name of the number.
- K.NO.1e1 Write or select the numerals 1-10.
- 1.NO.1d3 Identify numerals 0-31.
- 1.NO.1d4 Identify the numeral up to 31 when presented the name.
- 1.NO.1e2 Write or select the numerals 0-31.
- 1.NO.1i1 Recognize zero as representing none or no objects.

Count to tell the numbers of objects

K.CC.B.4 Understand the relationship between numbers and quantities; connect counting to cardinality.

a. When counting objects, say the number names in the standards order, pairing each object with one and only one number name and each number name with one and only one object.
b. Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
c. Understand that each successive number name refers to a quantity that is one larger.

CCCs linked to K.CC.B.4

- K.NO.1b2 Identify the set that has more.
- 1.NO.1c1 Use a number line to count up to 31 objects by matching 1 object per number.
- K.NO.1a4 Count up to 10 objects in line, rectangle, or array.
- K.NO.1b1 Match the numeral to the number of objects in a set.
- 1.NO.1a8 Count up to 31 objects in a line, rectangle, or array.

K.CC.B.5 Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array, or a circle, or as many as 10 things in a scattered configuration; given a number from 1-10, count out that many objects.

CCCs linked to K.CC.B.5

- K.DPS.1a1 Select a question that is answered by collected data.
- K.NO.1a4 Count up to 10 objects in a line, rectangle, or array.

Compare numbers

K.CC.C.6 Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group, e.g., by using matching and counting strategies.

CCCs linked to K.CC.C.6

- 1.NO.1b3 Compare 2 sets and identify the set that is either greater than or less than the other set.
- 1.NO.1f2 Order up to 3 sets that have up to 10 objects in each set.
- 1.NO.1f3 Order up to 3 sets with up to 20 objects in each set.
- 1.NO.1f4 Order up to 3 numbers up to 31.
- 2.SE.1c1 Compare sets and use appropriate symbol to label the first as =, <, or > the second set.

K.CC.C.7 Compare two numbers between 1 and 10 presented as written numerals.

CCCs linked to K.CC.C.7

- 1.NO.1f5 Identify the smaller or larger number given 2 numbers between 0-31.
- K.NO.1f1 Identify the smaller or larger number given 2 numbers between 0-10.

Operations and Algebraic Thinking—K.OA

Understand addition as putting together and adding to and understand subtraction as taking apart and taking from.

K.OA.A.1 Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.

CCCs linked to K.OA.A.1

- K.PRF.1b1 Use objects or pictures to respond appropriately to "add _" and "take away".
- K.PRF.1b2 Communicate answer after adding or taking away.

K.OA.A.2 Solve addition and subtraction word problems. Add and subtract within 10 (e.g., by using objects or drawings to represent the problem).

CCCs linked to K.OA.A.2

- K.PRF.1c1 Solve one step addition and subtraction word problems. Add and subtract word problems and add and subtract within 10 objects, drawings, and pictures.
- K.NO.2a1 Count 2 sets to find sums up to 10.
- K.NO.2a3 Solve word problems within 10.
- 1.NO.2a5 Count 2 sets to find sums up to 10.

K.OA.A.3 Decompress numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5= 2 + 3 and 5 = 4 + 1).

CCCs linked to K.OA.A.3

- K.NO.2a2 Decompose a set of up to 10 objects into a group; count the quantity in each group.
- 1.NO.2a7 Decompose a set of up to 10 objects into a group; count the quantity in each group.

K.OA.A.4 For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using group objects or drawings, and record the answer with a drawing or equation.

CCCs linked to K.OA.A.4

1.NO.2a4 For any number from 1 to 9, find the number that makes 1o when added to the given number, e.g., by using objects or drawings, and record or select the answer.

K.OA.A.5 Fluently add and subtract within 5.

CCCs linked to K.OA.A.5

- 1.NO.2a5 Count 2 sets to find sums up to 10.
- 1.NO.2a7 Decompose a set of up to 10 objects into a group; count the quantity in each group.

Number and Operations in Base Ten—K.NBT

Work with numbers 11-19 to gain foundations for place value.

K.NBT.A.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using object or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.

CCCs linked to K.NBT.A.1
1.NO.1h1 Build representations of numbers up to 19 by creating a group of 10 and some 1s (e.g., 13 = one 10 and three 1s).

Measurement and Data—K.MD

Describe and compare measurable attributes

K.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

CCCs linked to K.MD.1
K.ME.1a1 Describe objects in terms of measurable attributes (longer, shorter, heavier, lighter…)

K.MD.2 Directly compare two objects with a measurable attribute in common, to see which objects has "more of"/"less of" the attribute, and describe the difference, for example, directly compare the heights of two children and describe one child as taller/shorter.

CCCs linked to K.MD.2
K.ME.1b2 Compare 2 objects with a measurable attribute in common to see which object has more/less of the attribute (length, height, weight).

Classify objects and count the number of objects in each category.

K.MD.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count.

CCCs linked to K.MD.3
K.ME.1b1 Sort objects by characteristics (e.g., big/little, colors, shapes, etc.).

Geometry—K.G.

Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

K.G.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

CCCs linked K.G.1
K.GM.1a3 Use spatial language (e.g., above, below, etc.) to describe two-dimensional shapes.

K.G.2 Correctly name shapes regardless of their orientations or overall size.

CCCs linked to K.G.2
K.GM.1a1 Recognize two-dimensional shapes (e.g., circle, square, triangle, rectangle) regardless of orientation or size.

K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

CCCs linked to K.G.3
1.GM.1b1 Identify shapes as two-dimensional (lying flat) or three-dimensional (solid).

Analyze, compare, create, and compose shapes.

K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes an orientation, using informal language to describe their similarities, differences, parts (e.g., having sides of equal length).

CCCs linked to K.G.4

- K.GM.1a2 Recognize two-dimensional shapes in environment regardless of orientation or size.
- K.GM.1a3 Use spatial language (e.g., above, below, etc.) to describe two-dimensional shapes.
- 1.GM.1b2 Distinguish two-dimensional shapes based upon their defining attributes (i.e., size,corners, and points).

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.

CCCs linked to K.G.5
K.GM.1c1 Compose a larger shape from smaller shapes.

K.G.6 Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touch to make a rectangle?"

CCCs linked K.G.6
K.GM.1c1 Compose a larger shape from smaller shapes.

Core Content Connectors by Common Core State Standards: Mathematics, Grade 1

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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.

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.

Operations and Algebraic Thinking –1.OA

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.

CCCs linked to 1.OA.1

- 1.NO.2a9 Use manipulatives or representations to write simple addition or subtraction equations within 20 based upon a word problem.
- 1.NO.2a10 Use data presented in graphs (i.e., pictorial, object) to solve one step "how many more" or "how many less" word problems.
- 1.NO.2a11 Solve word problems within 20.
- PRF.1b3 Using objects or pictures respond appropriately to "add _" and "take away_____".
- 1.PRF.1c2 Solve one step addition and subtraction word problems where the change or result is unknown (4 + _ = 7) or (4 + 3 = _), within 20 using objects, drawings, and pictures.
- 2.NO.2a15 Remove objects from a set in a subtraction situation to find the amount remaining up to a minimum of 20.

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.

CCCs linked to 1.OA.2

1.NO.2a11 Solve word problems within 20.

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 10, so 2 + 6 + 4 = 2+10=12. Associative property of addition.

CCCs linked to 1.OA.3

- 1.NO.1i2 Recognize zero as an additive identity.
- 2.NO.2b1 Use commutative properties to solve addition problems with sums up to 20 (e.g., 3 + 8 = 11 therefore 8 + 3 = _____).
- 2.NO.2b2 Use associative property to solve addition problems with sums up to 20.

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.

CCCs linked to 1.OA.4

2.NO.2a15 Remove objects from a set in a subtraction situation to find the amount remaining up to a minuend of 20.

Add and subtract within 20.

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

CCCs linked to 1.OA.5

- 1.NO.2a8 Decompose a set of up to 20 objects into a group; count the quantity in each group.
- 1.NO.2a6 Count 2 sets to find sums up to 20.

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).

CCCs linked to 1.OA.6

- 1.NO.2a6 Count 2 sets to find sums up to 20.
- 1.NO.2a8 Decompose a set of up to 20 objects into a group; count the quantity in each group.

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.

CCCs linked to 1.OA.7

- 1.NO.2c1 Identify and apply addition and equal signs.
- 2.SE.1c2 Label simple equations as = or with the phrase not equal.
- 2.NO.2c2 Identify and apply addition, subtraction, and equal signs.

1.OA.8 Determine the unknown whole number in an addition or subtraction equation rotating to 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 = ___.

CCCs linked to 1.OA.8

2.SE.1d2 Represent a “taking away” situation with the – symbol.

Number and Operations in Base Ten—1.NBT

Extend the counting sequence.

1.NBT.1Count to 120, starting at any less than 120. In this range, read and write numerals and represent several objects with a written numeral.

CCCs linked to 1.NBT.1
- 1.NO.1a6 Rote count to 100.
- 2.NO.1a9 Rote count to 100.

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).

CCCs linked to 1.NBT.2
- 1.NO.1h1 Build representations of numbers up to 19 by creating a group of 10 and some 1s (e.g., 13 = one 10 and three 1s).
- 1.NO.1h2 Identify the value of the numbers in the tens and ones place within a given number up to 31.
- 2.NO.1h4 Build representations of 3-digit number using tens and ones.

1.NBT.3 Compare two-digit number based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.

CCCs linked to 1.NBT.3
- 1.NO.1h3 Compare two-digit numbers up to 31 using representations and numbers (e.g., identify more tens, less tens, more ones, less ones, larger number, smaller number).
- 2.NO.1h6 Compare two-digit numbers using representations and numbers (e.g., identify more tens, less tens, more ones, less ones, larger number, smaller number).

Use place values 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 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.

CCCs linked to 1.NBT.4
2.NO.2c3 Compose ones into tens and/or tens into hundreds in addition situation.

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.

CCCs linked to 1.NBT.5
2.NO.1e8 Mentally add or subtract 10 from a given set from the 10s family (e.g., what is 10 more than 50? What is 10 less than 70?).

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.

CCCs linked to 1.NBT.6
2.NO.2c4 Decompose tens into ones and/or hundreds into tens in subtraction situations.

Measurement and Data—1.MD

Measure lengths indirectly and by iterating length units.

1.MD.1Order three objects by length; compare the lengths of two objects indirectly by using a third object.

CCCs linked to 1.MD.1

- 1.ME.1b3 Order up to three objects based on a measurable attribute (height, weight, and length).
- 1.ME.1b4 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 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.

CCCs linked to 1.MD.2

- 1.ME.2a1 Measure using copies of one object to measure another.
- 1.ME.2b1 Express length of an object as a whole number of lengths unit by laying multiple copies of a shorter object to end to end.
- 1.ME.1c1 Compare two units of measurement and identify which unit would require when measuring a selected object (e.g., I can measure with paper clips or markers, which unit will require more to measure the table?).

Tell and write time.

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

CCCs linked to 1.MD.3

- 1.ME.2a2 Use time to sequence up to three events, using a digital or analog clock.
- 2.ME.1a5 Tell time to the nearest 1/2 hour using digital clocks.

Represent and interpret data.

1.MD.4 Organize, represent, and interpret data with up to three categories; risk and answer questions about the total number of data points, how many in each category, and how many are in one category than in another.

CCCs linked to 1.MD.4

- 1.DPS.1a2 Select questions that ask about “How many” and represent up to three categories that can be concretely represented.
- 1DPS.1a3 Identify 2 categories resulting from a selected question.
- 1.DPS.1a4 Analyze data by sorting into 2 categories; answer questions about the total number of data points and how many in each category.
- 1.DPS. 1c1 Using a picture graph, represent each object/person counted on the graph (1:1 correspondence) for 2 or more categories.
- 1.DPS.1d1 Interpret a picture graph to answer questions about how many in each category.
- 1.DPS.1e1 Compare the values of the two categories of data in terms of more or less.
- 2.DPS.1a5 Select a question about three attributes that can be concretely represented.
- 2.DPS.1a6 Identify up to three categories resulting from a selected question.

Geometry—1.G

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.

CCCs linked 1.G.1

1.GM.1b2 Distinguish two-dimensional shapes based upon their defining attributes (i.e., size, corners, and points).

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.

CCCs linked to 1.G.2

- 2.GM.1d1 Compose three-dimensional shapes.
- 1.GM.1c2 Compose two- and three-dimensional shapes.

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.

CCCs linked to 1.G.3

1.GM.1f1 Partition circles and rectangles into 2 and 4 equal parts.

Core Content Connectors by Common Core State Standards: Mathematics, Grade 2

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Grade 2 Overview

Operations and Algebraic Thinking

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

Number and Operations in Base Ten

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

Measurement and Data

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

Geometry

- Reason with shapes and their attributes.

Operations and Algebraic Thinking—2.OA

Represent and solve problems involving addition and subtraction.

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

CCCs linked to 2.OA.1

- 2.SE.1d1 Represent addition of two sets when shown the + symbol.
- 2.NO.2a.16 Solve word problems within 20.
- 2.NO.2a17 Solve word problems within 100.
- 2.PRF.1c3 Solve one- or two-step addition and subtraction problems, and add and subtract within 100, using objects, drawings, and pictures.
- 2.PRF.1c4 Use pictures, drawings or objects to represent the steps of a problem.
- 2.SE.1d1 Represent addition of two sets when shown the + symbol.

Add and subtract within 20.

2.OA.2 Fluently add and subtract within 20 using mental strategies. By end of grade 2, know from memory all sums of two one-digit numbers.

NO CCCs linked to 2.OA.2

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

2.OA.3 Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; written an equation to express an even number as a sum of two equal addends.

CCCs linked to 2.OA.3

2.NO.1e7 Identify numbers as odd or even.

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

CCCs linked to 2.OA.4

- 3.NO.2d1 Find the total number of objects when given the number of identical groups and the number of objects in each group, neither number larger than 5.
- 3.NO.2d2 Find the total number inside an array with neither number in the columns or rows larger than 5.

Number and Operations in Base Ten—2.NBT

Understand place value.

2.NBT.1 Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones, e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

a. 100 can be thought of as a bundle of ten tens—called a hundred.
b. The numbers of 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three,four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

CCCs linked to 2.NBT.1

- 2.NO.1h4 Build representations of two-digit numbers using tens and ones.
- 2.NO.1h5 Build representations of three-digit numbers using hundreds, tens, and ones.

2.NBT.2 Count within 1000; skip-count by 5s, 10s, and 100s.

CCCs linked to 2.NBT.2

- 2.NO.1e4 Skip count by 5s.
- 2.NO.1e5 Skip count by 10s.
- 2.NO.1e6 Skip count by 100s.
- 3.NO.1e1 Skip count by 100s.

2.NBT.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.

CCCs linked to 2.NBT.3

- 2.NO.1d5 Identify numerals 0-100.
- 2.NO.1d6 Identify the numeral between 0 and 100 when presented the name.
- 2.NO.1e3 Write or select the numerals 0-100.
- 2,NO.1h8 Write or select expanded form for any two-digit number.
- 2.NO.1h9 Write or select expanded form for any three-digit number.
- 2.NO.1i3 Explain what the zero represents in place value (hundreds, tens, ones) in a number.

2.NBT.4 Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.

CCCs linked to 2.NBT.4

- 2.NO.1f6 Compare (greater than, less than, equal to) two numbers up to 100.
- 2.NO.1h6 Compare two-digit numbers using representations and numbers (e.g., identify more tens, less tens, more ones, less ones, larger number, smaller number).
- 2.NO.1h7 Compare three-digit numbers using representations and numbers (e.g., identify more hundreds, less hundreds, more tens, less tens, more ones, less ones, larger number, smaller number).

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

2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCCs linked to 2.NBT.5

- 2.NO.2a12 Model addition and subtraction with base 10 blocks within 20.
- 2.NO.2a13 Model addition and subtraction with base 10 blocks within 50.
- 2.NO.2a14 Model addition and subtraction with base 10 blocks within 100.

2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations.

CCCs linked to 2.NBT.6

2.NO.2a19 Combine up to 3 sets of 20 or less.

2.NBT.7 Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

CCCs linked to 2.NBT.7

- 2.NO.2c3 Compose ones into tens and/or tens into hundreds in addition situations.
- 2.NO.2c4 Decompose tens into ones and/or hundreds into tens in subtraction situations.

2.NBT.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

CCCs linked to 2.NBT.8

- 2.NO.1e8 Mentally add or subtract 10 from a given set from the 10s family (e.g., what is 10 more than 50? What is 10 less than 70?).
- 2.NO.1e9 Mentally add or subtract 100 from a given set from the 100s family (e.g., what is 100 more than 500? What is 100 less than 700?)
- 3.NO.1e2 Mentally add or subtract 100 from a given set from the 100s family (e.g., what is 100 more than 500? What is 100 less than 700?)

2.NBT.9 Explain why addition and subtraction strategies work, using place value and the properties of operations.

NO CCCs linked to 2.NBT.9

Measurement and Data—2.MD

Measure and estimate lengths in standard units.

2.MD.1 Measure the length of an object by selecting and using appropriate tools such as ruler, yardsticks, meter sticks, and measuring tapes.

CCCs linked to 2.MD.1

- 2.ME.1a3 Select appropriate tool and unit or measurement to measure an object (ruler or yard stick; inches or feet).
- 2.ME.2b2 Select appropriate tools and demonstrate or identify appropriate measuring techniques.

2.MD.2 Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

CCCs linked to 2.MD.2

- 2.ME.1c2 Measure the attributes (length, width, height) of an object using two different two different size units.
- 2.ME.1c2 Measure the attributes of an object using two different two different size units.

2.MD.3 Estimate lengths using units of inches, feet, centimeters, and meters.

CCCs linked to 2.MD.3

- 2.ME.1c3 Recognize that standard measurement units can be decomposed into smaller units.
- 2.ME.2a3 Estimate the length of an object using units of feet and inches.

2.MD.4 Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard-length unit.

CCCs linked to 2.MD.4

- 2.ME.1b5 Solve one-word problems involving the difference in standard length units.
- 2.ME.2a4 Solve one-step subtraction problems involving the difference of the lengths of two objects in standard length units.

Relate addition and subtraction to length.

2.MD.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

CCCs linked to 2.MD.5

2.ME.1b5 Solve word problems involving the difference in standard length units.

2.MD.6 Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2…, and represent whole-number sums and differences within 100 on a number line diagram.

CCCs linked to 2.MD.6
2.NO2a18 Use diagrams and number lines to solve addition or subtractions problems.

Work with time and money.

2.MD.7 Tell and write time from analog and digital clocks to the nearest five minutes, using a.m., and p.m.

CCCs linked to 2.MD.7
3.ME.1a1 Tell time to the nearest 5 minutes using a digital clock.

2.MD.8 Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. Example: If you have two dimes and three pennies, how many cents do you have?

CCCs linked to 2.MD.8
2.ME.1a4 Solve word problems using dollar bills, quarters, dimes, nickels, or pennies.

Represent and interpret data.

2.MD.9 Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object, show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.

CCCs linked to 2.MD.9

2.DPS.1c3 Organize data by representing continuous data on a line plot.

2.MD.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simply put-together, take-apart, and compare problems using information presented in a bar graph.

CCCs linked to 2.MD.10

- 2.DPS.1d2 Identify the value of each category represented on picture graph and bar graph or each point on a line plot.
- 2.DPS.1a7 Analyze data by sorting into categories established by each question.
- 2.DPS.1c2 Organize data by representing categorical data on a pictorial graph or bar graph.
- 2.DPS.1e2 Compare the information shown in a bar graph or picture graph with up to four categories. Solve simple comparisons of how many more or how many less.

Geometry—2.G

Reason with shapes and their attributes.

2.G.1 Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.

CCCs linked to 2.G.1

- 2.GM.1a4 Identify two-dimensional shapes such as rhombus, pentagons, hexagons, octagon, ovals, equilateral, isosceles, and scalene triangles.
- 2.GM.1b3 Distinguish two- or three-dimensional shapes based upon their attributes (i.e. # of sides, equal or different lengths of sides, # of faces, # of corners).
- 2.GM.1e1 Draw two-dimensional shapes with specific attributes.

2.G.2 Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.

CCCs linked to 2.G.2

3.NO.2d1 Find the total number of objects when given the number of identical groups and the number of objects in each group, neither number larger than 5.

2.G.3 Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.

CCCs linked to 2.G.3

- 2.GM.1f2 Partition circles and rectangles into two and four equal parts.
- 2.GM.1f3 Label a partitioned shape (e.g., one whole rectangle was separated into two halves, one whole circle was separated into three thirds).

Core Content Connectors by Common Core State Standards: Mathematics, Grade 3

MSAA Instructional Resource Guide, Revised June 2024 from the NCSC content developed as part of the National Center and State Collaborative under a grant from the US Department of Education.

This view is designed to mirror the Common Core document while also including the CCCs linked to each CCSS.

Grade 3 Overview

Operations and Algebraic Thinking

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100.
- Solve problems involving the four operation and identify and explain patterns in arithmetic.

Number and Operations in Base Ten

- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Numbers and Operations—Fractions

- Develop understanding of fractions as numbers.

Measurement and Data

- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Geometry

- Reason with shapes and their attributes.

Operations and Algebraic Thinking—3.OA

Represent and solve problems involving multiplication division.

3.OA.1 Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.

CCCs linked to 3.OA.1

- 3.NO.2d1 Find the total number of objects when given the number of identical groups and the number of objects in each group, neither larger than 5.
- 3.NO.2d2 Find the total number inside an array with neither number in the columns or rows larger than 5.
- 3.NO.2d3 Solve multiplication problems with neither number greater than 5.
- 3.PRF.1d1 Use objects to model multiplication and division situations involving up to 5 groups with up to 5 objects in each group and interpret the results.
- 4.NO.2d6 Find total number inside an array with neither number in the columns or rows larger than 10.
- 4.NO.2d8 Match an accurate addition and multiplication equation to a representation.
- 4.PRF.1d2 Use objects to model multiplication and division situations involving up to 10 groups with up to 5 objects in each group and interpret the results.

3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as several shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which several shares or several groups can be expressed as 56 ÷ 8.

CCCs linked to 3.OA.2

- 3.NO.2d4 Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 5.
- 3.NO.2d5 Determine the number of groups given the total number of objects and the number of objects in each group where the number in each group and the number of groups is not greater than 5.
- 3.PRF.1d1 Use objects to model multiplication and division situations involving up to 5 groups with up to 5 objects in each group and interpret the results.

3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

CCCs linked to 3.OA.3

3.NO.2e1 Solve or solve and check one- or two-step word problems requiring addition, subtraction, or multiplication with answers up to 100.

3.OA.4 Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = __÷ 3, 6 x 6 = ?

CCCs linked to 3.OA.4

4.NO.2d7 Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 10.

Understand properties of multiplication and the relationship between multiplication and division.

3.OA.5 Apply properties of operations as strategies to multiply and divide. Examples: If 6 x 4 = 24 is known, then 4 x 6 = 24 is also known (Commutative property of multiplication). 3 x 5 x 2 can be found by 3 x 5 = 15, then 15 x 2 = 30, or by 5 x 2 = 10, then 3 x 10 = 30 (Associative property of multiplication). Knowing that 8 x 5 =40 and 8 x 2 = 16, one can find 8 x 7 as 8 x (5+ 2) = (8 x 5) + (8 x 2) = 40 + 16 = 56 (Distributive property).

CCCs linked to 3.OA.5

3.PRF.2d2 Apply properties of operations as strategies to multiply and divide.

3.OA.6 Understand division as an unknown-factor problem. For example, find 32÷8 by finding the number that makes 32 when multiplied by 8.

CCCs linked to 3.OA.6

- 3.NO.2d4 Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 5.
- 3.NO.2d5 Determine the number of groups given the total number of objects and the number of objects in each group where the number in each group and the number of groups is not greater than 5.

Multiply and divide within 100.

3.OA.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 x 5 = 40, one knows 40÷5=8) or properties of operations. By the end of grade 3, know from memory all products of two one-digit numbers.

NO CCCs linked to 3.OA.7

Solve problems involving the four operations and identify and explain problems in arithmetic.

3.OA.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCCs linked to 3.OA.8

3.NO.2e1 Solve or solve and check one or two step word problems requiring addition, subtraction, or multiplication with answers up to 100.

3.OA.9 Identify arithmetic patterns (including patterns in the addition table or multiplication table) and explain them using properties of operations. For example, observe that four times a number is always even, and explain why four times a number can be decomposed into two equal addends.

CCCs linked to 3.OA.9

- 3.PRF.1e1 Describe the rule for a numerical pattern (e.g., increase by 2, 5, or 10).
- 3.PRF.1e2 Select or name the three next terms in a numerical pattern where numbers increase by 2, 5, 10.
- 3.PRF.2d1 Identify multiplication patterns in a real-world setting.

Numbers and Operations in Base Ten—3.NBT

Understand place value understanding and properties of operations to perform multi-digit arithmetic.

3.NBT.1Use place value understanding to round whole numbers to the nearest 10 or 100.

CCCs linked to 3.NBT.1

- 3.NO.1j3 Use place value to round to the nearest 10 or 100.
- 3.NO.1j4 Use rounding to solve word problems.

3.NBT.2 Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

CCCs linked to 3.NBT.2

- 3.NO.2c1 Solve multi-step addition and subtraction problems up to 100.
- 3.NO.2b1 Use the relationships between addition and subtraction to solve problems.

3.NBT.3 Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.

CCCs linked to 3.NBT.3

4.NO.2f2 Solve multiplication problems up to two digits by one digit.

Numbers and Operations—Fractions—3.NF

Develop an understanding of fractions as numbers.

3.NF.1 Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.

CCCs linked to 3.NF.1

- 3.NO.1l1 Identify the number of highlighted parts (numerator) of a given representation (rectangles and circles).
- 3.NO.1l2 Identify the total number of parts (denominator) of a given representation (rectangles and circles).
- 3.NO.1l3 Identify the fraction that matches the representation (rectangles and circles; halves, fourths, thirds, eights).
- 4.NO.1n1 Select a model of a given fraction (halves, thirds, fourths, sixths, eights).
- 4.NO.2g1 Using a representation, decompose a fraction into multiple copies of a unit fraction (e.g., 3/4 = 1/4 + 1/4 + 1/4).

3.NF.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.
b. Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.

CCCs linked to 3.NF.2

- H.NO.1l4 Identify that a part of a rectangle can be represented as a fraction that has a value between 0 and 1.
- 3.NO.1l5 Locate given common unit fractions (i.e.,1/2, 1/4, 1/8), on a number line or ruler.
- 4.NO.1l6 Locate fractions on a number line.
- 4.NO.1l7 Order fractions on a number line.

3.NF.3 Explain equivalence of fractions in special cases and compare fractions by reasoning about their size.

- Understand two fractions as equivalent (equal) if they are the same size or the same point on a number line.
- Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3).
- Explain why the fractions are equivalent, e.g., by using a visual fraction model.
- Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.
- Compare two fractions with the same numerator or the same denominator by reasoning about their size, recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols <, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

CCCs linked to 3.NF.3

- 3.SE.1g1 Use =, <, or > to compare two fractions with the same numerator or denominator.
- 4.SE.1h1 Express whole numbers as fractions.
- 4.NO.1m1 Determine equivalent fractions.
- 4.NO.2h3 Solve word problems involving addition and subtraction of fractions with like denominators (2, 3, 4, or 8).

Measurement and Data—3.MD

Solve problems involving measurement and estimation of intervals of time, liquid, volumes, and masses of objects.

3.MD.1 Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

CCCs linked to 3.MD.1

- 3.ME.1a2 Solve word problems involving the addition and subtraction of time intervals of whole hours or within an hour (whole hours: 5:00 to 8:00, within hours: 7:15 to 7:24).
- 3.PRF.1f1 Determine the equivalence between number of minutes and the fraction of the hour (e.g., 30 minutes = ½ hour).
- 3.PRF.1f2 Determine the equivalence between the number of minutes and the number of hours

3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

CCCs linked to 3.MD.2

- 3.ME.1f1 Select appropriate units for measurement (liquid volume, area, time, money).
- 3.ME.1f2 Add to solve one-step word problems.
- 3.ME.2e1 Select appropriate tool for measurement; liquid volume, area, time, and money.
- 3.ME.2i1 Estimate liquid volume.
- 4.ME.2g1 Determine whether a situation calls for a precise measurement or an estimation (distance, volume, mass, time, money).

Represent and interpret data.

3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent five pets.

CCCs linked to 3.MD.3

- 3.DPS.1g1 Collect data, organize into picture, or bar graph.
- 3.DPS.1i1 Select the appropriate statement that describes the data representations based on a given graph (picture, bar, line plots).
- 4.DPS.1g3 Collect data, organize in graph (e.g., picture graph, line plot, bar graph).
- 4.DPS.1i1 Select the appropriate statement that describes the data representations based on a given graph (picture, bar, line plots).
- 4.DPS.1j1 Select an appropriate statement that describes the most frequent or the least frequent data point using a line plot, picture graph, or bar graph.
- 5.DPS.1c1 Collect and graph data: bar graph, line plots, picture graph (e.g., average height among three classrooms, number of boys and girls).

3.MD.4 Generate measurement data by measuring lengths, using rulers marked with halves and fourth of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters.

CCCs linked to 3.MD.4

- 3.ME.2e2 Generate measurement data by measuring lengths using rules marked with halves and fourth of an inch.
- 3.ME.2e3 Measure to solve problems using number lines and ruler to 1 inch, 1/2 inch, or 1/4 of an inch.
- 3.DPS.1g2 Organize measurement data into a line plot.
- 4.DPS.1k2 Apply results of data to a real-world situation.

Geometric measurement: understand concepts of area and relate area to multiplication and to addition.

3.MD.5 Recognize are as an attribute of plane figures and understand concepts of area measurement.

- A square with side length 1 unit, called "a unit square," is said to have one square unit" of are, and can be used to measure area.
- A plane figure which can be covered without gaps or overlaps by n unit squares is said to have an area of n square units.

CCCs linked to 3.MD.5

3.ME.1d1 Use tiling and multiplication to determine area.

3.MD.6 Measure areas by counting unit square (square cm, square m, square in, square ft, and improvised units).

CCCs linked to 3.MD.6

3.ME.1d2 Measure area of rectangles by counting squares.

3.MD.7 Relate area to the operations of multiplication and addition.

- Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.
- Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solving real-world and mathematical problems and represent whole-number products as rectangular areas in mathematical reasoning.
- Use tiling to show in a concrete case that the area of a rectangle with whole number side lengths a and b + c is the sum of a x b and a x c. Use area model to represent the distributive property in mathematical reasoning.
- Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real-world problems.

CCCs linked to 3.MD.7

- 3.ME.1d1 Use tiling and addition to determine area.
- 4.ME.1d3 Use tiling and multiplication to determine area.
- 4.ME.2h1 Apply the formulas for area and perimeter to solve real-world problems.
- 4.PRF.1f3 Apply the distributive property to solve problems with models.

Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

3.MD.8 Solve real-world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.

CCCs linked to 3.MD.8

- 3.ME.1g1 Identify a figure as getting larger or smaller when the dimensions of the figure change.
- 3.ME.2h1 Use addition to find the perimeter of a rectangle.
- 4.ME.2h1 Apply the formulas for area and perimeter to solve real-world problems.

Geometry—3.G

Reason with shapes and their attributes.

3.G.1 Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.

CCCs linked to 3.G.1
3.GM.1h1 Identify shared attributes of shapes.

3.G.2 Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into four parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

CCCs linked to 3.G.2
3.GM.1i1 Partition rectangles into equal parts with equal area.

Core Content Connectors by Common Core State Standards: Mathematics, Grade 4

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Grade 4 Overview

Operations and Algebraic Thinking

- Use the four operations with whole number to solve problems.
- Grain familiarity with factors and multiples.
- Generates and analyze patterns.

Number and Operations in Base Ten

- Generalize place value understanding for multi-digit whole numbers.
- Use place value understanding and properties of operations to perform multi-digit arithmetic.

Numbers and Operations—Fractions

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.
- Understand decimal notation for fractions and compare decimal functions.

Measurement and Data

- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- Represent and interpret data.
- Geometric measurement: understand concepts of angle and measure angles.

Geometry

- Draw and identify lines and angles and classify shapes by properties of their lines and angles.

Operations and Algebraic Thinking—4.OA

Use the four operations with whole numbers to solve problems.

4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 x 7 as a statement that 35 is 5 times as many as 7, and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

CCCs linked to 4.OA.1

4.PRF.1d2 Use objects to model multiplication and division situations involving up to 5 groups with up to 5 objects in each group and interpret the results.

4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

CCCs linked to 4.OA.2

- 4.NO.2d7 Determine how many objects go into each group when given the total number of objects and the number of groups where the number in each group or number of groups is not greater than 10.
- 4.PRF.1e3 Solve multiplicative comparisons with an unknown using up to 2-digit numbers with information presented in a graph or word problem (e.g., an orange hat cost $3. A purple hat cost 2 times as much. How much does the purple hat cost? (3 x 2 = p)

4.OA.3 Solve multi-step word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

CCCs linked to 4.OA.3

- 4.NO.2e2 Solve or solve and check one or two step word problems requiring addition, subtraction, or multiplication with answers up to 100.
- 5.NO.2a1 Solve problems or word problems using up to three-digit numbers and addition or subtraction or multiplication.

Gain familiarity with factors and multiples.

4.OA.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1- 100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

CCCs linked to 4.OA.4

4.NO.2f1 Identify multiples for a whole number (e.g., 2 = 2, 4, 6, 8, 10).

Generate and analyze patterns.

4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

CCCs linked to 4.OA.5

- 4.PRF.2d3 Generate a pattern when given a rule and word problem (I run 3 miles every day, how many miles have I ran in 3 days?).
- 4.PRF.2e1 Extend a numerical pattern when the rule is provided.
- 5.PRF.2a1 Generate a pattern that follows the provided rule.

Numbers and Operations in Base Ten—4.NBT

Generalize place value understanding for multi-digit whole numbers.

4.NBT.1 Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700/70 = 10 by applying concepts of place value and division.

CCCs linked to 4.NBT.1

- 4.NO.1k1 Compare the value of a number when it is represented in different place values of two 3-digit numbers.
- 4.NO.1k1 Compare the value of a number when it is represented in different place values of two 3-digit numbers.

4.NBT.2 Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

CCCs linked to 4.NBT.2

- 4.NO.1j6 Compare multi-digit numbers using representations and numbers.
- 4.NO.1j7 Write or select the expanded form for multi-digit number.

4.NBT.3 Use place value understanding to round multi-digit whole numbers to any place.

CCCs linked to 4.NBT.3

4.NO.1j5 Use place value to round to any place (i.e., ones, tens, hundreds, thousands).

Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NBT.4 Fluently add and subtract multi-digit whole number using the standard algorithm.

CCCs linked to 4.NBT.4

4.NO.2c2 Solve multi-digit addition and subtraction problems up to 1000.

4.NBT.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or are models.

CCCs linked to 4.NBT.5

- 4.NO.2f2 Solve multiplication problems up to two digits by one digit.
- 4.PRF.1f4 Solve a two-digit by 1 digit multiplication problem using two different strategies.

4.NBT.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCCs linked to 4.NBT.6

5.NO.2a2 Separate a group of objects into equal sets when given the number of sets to find the total in each set with the total number less than 50.

Numbers and Operations—Fractions 4.NF

Extend understanding of fraction equivalence and ordering.

4.NF.1 Explain why a fraction a/b is equivalent to a fraction (n x a)/(n x b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

CCCs linked to 4.NF.1
4.NO.1m1 Determine equivalent fractions.

4.NF.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or < and justify the conclusions e.g., by using a visual fraction model.

CCCs linked to 4.NF.2

- 4.SE.1g2 Use =, <, or > to compare two fractions (fractions with a denominator or 10 or less).
- 4.NO.1n2 Compare up to 2 given fractions that have different denominators.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

4.NF.3 Understand a fraction a/b with a> 1 as a sum of fractions 1/b.

- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
- Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.
- Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
- Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

CCCs linked to 4.NF.3

- 4.NO.2g1 Using a representation, decompose a fraction into multiple copies of a unit fraction (e.g., 3/4 = 1/4 + 1/4 + 1/4).
- 4.NO.2h1 Add and subtract fractions with like denominators of (2, 3, 4, or 8).
- 4.NO.2h2 Add and subtract fractions with like denominators (2, 3, 4, or 8).
- 4.NO.2h3 Solve word problems involving addition and subtraction of fractions with like denominators (2, 3, 4, or 8).

4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

- Understand a fraction a/b as a multiple of 1/b. for example, use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equations 5/4 = 5 x (1/4).
- Understand a multiple of a/b as a multiple of 1/b and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. In general, n x (a/b) = (n x a)/b.
- Solve one-word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

CCCs linked to 4.NF.4
5.NO.2b3 Multiply a fraction by a whole number or mixed number.

Understand decimal notation for fractions and compare decimal fractions.

4.NF.5 Express a fraction with a denominator 10 as an equivalent fraction with denominator 100 and use this technique to add two fractions with respective denominators 10 and 100. For example, express 3/10 as 30/100, and add 3/10 + 4/10 = 34/100.

CCCs linked to 4.NF.5
4.NO.1o2 Find the equivalent decimal for a given fraction.

Generate and analyze patterns.

4.NF.6 Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100. Describe a length as 0.62 meters and locate 0.62 on a number line diagram.

CCCs linked to 4.NF.6

- 4.SE.1h2 Identify the equivalent decimal for a fraction.
- 4.NO.1o1 Match a fraction with a denominator of 10 or 100 as a decimal (5/10 = 0.5).
- 4.NO1p1 Read, write, or select decimals to the tenths place.
- 4.NO.1p2 Read, write, or select decimals to the hundredths place.
- 5.NO.1c1 Rewrite a fraction as a decimal.
- 5.NO.1c2 Rewrite a decimal as a fraction.

4.NF.7 Compare two decimals to the hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions e.g., by using a visual model.

CCCs linked to 4.NF.7

- 4.SE.1g3 Use =, <, or > to compare two decimals (decimals in multiples of 10).
- 4.NO.1q1 Compare two decimals to the tenths place with a value of less than 1.
- 4.NO.1q2 Compare two decimals to the hundredths place with a value of less than 1.

Measurement and Data—4.MD

Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

4.MD.1 Know relative sizes of measurement unit within one system of units including kilometer, meter, centimeter; kilogram, gram; pound, ounce; liter, milliliter; hour, minute, second. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalent in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1. 12), (2, 24), (3, 36),…

CCCs linked to 4.MD.1

- 4.ME.2f1 Complete a conversion table for length and mass within a single system.
- 5.ME.1a1 Identify the appropriate units of measurement for different purposes in a real-life context.

4.MD.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

CCCs linked to 4.MD.2

4.ME.1g2 Solve word problems using perimeter and area where changes occur to the dimensions of a figure.

4.MD.3 Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

CCCs linked to 4.MD.3

4.ME.1g2 Solve word problems using perimeter and area where changes occur to the dimensions of a figure.

Represent and interpret data.

4.MD.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

CCCs linked to 4.MD.4

- 4.ME.2e7 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8).
- 4.ME.2e8 Solve problems involving addition and subtraction of fractions with like denominators by using information presented in line plots.

Geometric measurement: Understand concepts of angle and measure angles.

4.MD.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint and understand concepts of angle measurement.

a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.
b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

CCCs linked to 4.MD.5
4.GM.1j3 Recognize an angle in two-dimensional figures.

4.MD.6 Measure angles in who-number degrees using a protractor. Sketch angles of specified measure.

CCCs linked to 4.MD.6

- 4.ME.2e4 Select appropriate tool for measurement; mass, length, and angles.
- 4.ME.2e5 Construct a given angle.
- 4.ME.2e6 Measure right angles using a tool (e.g., angle ruler, protractor).

4.MD.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

NO CCCs linked to 4.MD.7

Geometry—4.G

Draw and identify lines and angles and classify shapes by properties of their lines and angles.

4.G.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

CCCs lined to 4.G.1

- 4.GM.1j1 Recognize a point, line, and line segment, rays in two-dimensional figures.
- 4.GM.1j2 Recognize perpendicular and parallel lines in two-dimensional figure.
- 4.GM.1j3 Recognize an angle in two-dimensional figures.
- 5.GM.1j1 Recognize parallel and perpendicular lines within the context of two-dimensional

4.G.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category and identify right triangles.

CCCs linked to 4.G.2

- 4.GM.1h2 Classify two-dimensional shapes based on attributes (# of angles).
- 4.GM.1j4 Categorize angles as right, acute, or obtuse.

4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

CCCs linked to 4.G.3

4.GM.1k1 Recognize a line of symmetry in a figure.

Core Content Connectors by Common Core State Standards: Mathematics, Grade 5

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This view is designed to mirror the Common Core document while also including the CCCs linked to each CCSS.

Grade 5 Overview

Operations and Algebraic Thinking

- Write and interpret numerical expressions.
- Analyze patterns and relationships.

Number and Operations in Base Ten

- Understand the place value system.
- Perform operations with multi-digit whole numbers and with decimals to hundredths.

Numbers and Operations—Fractions

- Use equivalent fractions as a strategy to add and subtract fractions.
- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Measurement and Data

- Convert like measurement units within a given measurement system.
- Represent and interpret data.
- Geometric measurement: understand concepts of volume and relate volume to multiplication and top addition.

Geometry

- Graph points on the coordinate plane to solve real-world and mathematical problems.
- Classify two-dimensional figures into categories based on their properties.

Operations and Algebraic Thinking—5.OA

Write and interpret numerical expressions.

5.OA.1 Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

CCCs linked to 5.OA.1
5.SE.1a1 Given a real-world problem, write an equation using 1 set of parentheses.

5.OA.2 Write simple expressions that record calculations with numbers and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7). Recognize that 3 (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

CCCs linked to 5.OA.2
5.SE.1a1 Given a real-world problem, write an expression using 1 set of parentheses.

Analyze patterns and relationships.

5.OA.3 Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns and graph the ordered pairs on a coordinate plane. For example, given the rule "add 3" and the starting number 0, and the given rule "add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the rms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

CCCs linked to 5.OA.3

- 5.PRF.1b1 Given 2 patterns involving the same context (e.g., collecting marbles) determine the first five terms and compare the values.
- 5.PRF.1b2 When given a line graph representing two arithmetic patterns, identify the relationship between the two.
- 5.PRF.1b3 Generate or select a comparison between two graphs from a similar situation.
- 6.PRF.2b2 Using provided table with numerical patterns, form ordered pairs.

Numbers and Operations in Base Ten—5.NBT

Understand the place value system

5.NBT.1 Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

CCCs linked to 5.NBT.1

- 5.NO.1a1 Compare the value of a number when it is represented in different place values of two three-digit numbers.
- 5.SE.1a1 Given a real-world problem, write an expression using 1 set of parentheses.

5.NBT.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole number exponents to denote powers of 10.

CCCs linked to 5.NBT.2

6.NO.1i1 Identify what an exponent represents (e.g., $8^3 = 8 \times 8 \times 8$).

5.NBT.3 Read, write, and compare decimals to thousandths.

a. Read and write decimals to thousands using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 x 100 + 4 x 10 + 7 x 1 + 3 x (1/10) + 9 x (1/100) +2 x (1/1000).
b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

CCCs linked to 5.NBT.3

- 5.NO.1b1 Read, write, or select a decimal to the hundredths place.
- 5.NO.1b2 Read, write, or select a decimal to the thousandths place.
- 5.NO.1b3 Compare two decimals to the thousandths place with a value of less than 1.

5.NBT.4 Use place value understanding to round decimals to any place. Perform operations with multi-digit whole numbers and with decimals to hundredths.

CCCs linked to 5.NBT.4

- 5.NO.1b4 Round decimals to the next whole number.
- 5.NO.1b5 Round decimals to the tenths place.
- 5.NO.1b6 Round decimals to the hundredths place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

5.NBT.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

CCCs linked to 5.NBT.5

5.NO.2a1 Solve problems or word problems using up to three-digit numbers and addition or subtraction or multiplication.

5.NBT.6 Find whole-number quotients of whole numbers with up to four-digit dividends and two- digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

CCCs linked to 5.NBT.6

- 5.NO.2a3 Find whole number quotients up to two dividends and two divisors.
- 5.NO.2a4 Find whole number quotients up to four dividends and two divisors.
- 5.NO.2a5 Solve word problems that require multiplication or division.

5.NBT.7 Add, subtract, multiply, and divide decimals to hundredths, 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.

CCCs linked to 5.NBT.7

5.NO.2c1 Solve one step problems using decimals.

Numbers and Operations—Fractions—5.NF

Use equivalent fractions as a strategy to add and subtract fractions.

5.NF.1 Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. In general, a/b + c/d = (ad + bc)/bd.

CCCs linked to 5.NF.1

- 5.NO.2b1 Add and subtract fractions with unlike denominators by replacing fractions with equivalent fractions (identical denominators).
- 5.NO.2b2 Add or subtract fractions with unlike denominators.

5.NF.2 Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7 by observing that 3/7 < 1/2. Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

CCCs linked to 5.NF.2

5.NO.2c2 Solve word problems involving the addition, subtraction, multiplication, or division of fractions.

Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

5.NF.3 Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole number leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that ¾ multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?

CCCs linked to 5.NF.3

5.NO.2b4 Divide unit fractions by whole numbers and whole numbers by unit fractions.

5.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

a. Interpret the product (a/b) x q as a part of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a x q ÷ b. For example, use a visual from fraction model to show (2/3) x 4 = 8/3 and create a story context for this equation. Do the same with (2/3) x (4/5) = 8/15. (In general, (a/b) x (c/d) = ac/bd.)
b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths. And show that the area is the same would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles and represent fraction products as rectangular areas.

CCCs linked to 5.NF.4

5.NO.2b3 Multiply a fraction by a whole or mixed number.

5.NF.5 Interpret multiplication as scaling (resizing) by:

a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence a/b = (n x a)/(n x b) to the effect of multiplying a/b by 1.

CCCs linked to 5.NF.5

- 5.PRF.1a1 Determine whether the product will increase of decrease based on the multiplier.
- 6.PRF.1a2 Determine whether the quotient will increase or decrease based on the divisor.

5.NF.6 Solve real world problems involving multiplication of fractions and mixed numbers e.g., by using visual fraction models or equations to represent the problem.

CCCs linked to 5.NF.6

5.NO.2b3 Multiply a fraction by a whole or mixed number.

5.NF.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

a. Interpret division of a unit by a non-zero whole number and compute such quotients. For example, create a story context or (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/2 because (1/12) x 4 = 1/3.
b. Interpret division of a whole number by a unit fraction and compute such quotients. For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 x (1/5) =4.
c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb. of chocolate equally? How many 1/3 cup servings are in 2 cups of raisins?

CCCs linked to 5.NF.7

- 5.NO.2b4 Divide unit fractions by whole numbers and whole numbers by unit fractions.
- 6.NO.2c4 Solve word problems involving the addition, subtraction, multiplication, or division of fractions.

Measurement and Data—5.MD

Convert like measurement units within a given measurement system.

5.MD.1Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m) and use these conversions in solving multi-step, real world problems. Represent and interpret data.

CCCs linked to 5.MD.1

- 5.ME.1b1 Convert measurements of time.
- 5.ME.1b2 Convert standard measurement of length.
- 5.ME.1b3 Convert standard measurements of mass.
- 5.ME.2a1 Solve problems involving conversions of standard measurement units when finding area, volume, time lapse, or mass.

Represent and interpret data.

5.MD.2 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, give different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally. Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

CCCs linked to 5.MD.2

5.DPS.1c1 Collect and graph data: bar graph, line plots, picture graph (e.g., average height among 3 classrooms, number of boys and girls).

Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

5.MD.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

a. A cube with side length 1 unit, called a "unit cube" is said to have "one cubic unit" of volume, and can be used to measure volume,
b. A solid figure which can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

CCCs linked to 5.MD.3

5.ME.2b1 Use filling and multiplication to determine volume.

Represent and interpret data.

5.MD.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.

CCCs linked to 5.MD.4

5.ME.2b1 Use filling and multiplication to determine volume.

5.MD.5 Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

a. Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.
b. Apply the formulas V = l x w x h and V = b x h for rectangular prisms to find volumes of right rectangular prisms with whole number edge lengths in the context of solving real world and mathematical problems.
c. Recognize volume as additive. Find volumes of solid figures composed of two non- overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

CCCs linked to 5.MD.5

- 6.ME.2b3 Decompose complex 3D shapes into simple 3D shapes to measure volume.
- 5.ME.2b2 Apply formula to solve one step problems involving volume.

Geometry—5.G

Graph points on the coordinate plane to solve real world and mathematical problems.

5.G.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x axis and x coordinate, y axis, and y coordinate).

CCCs linked to 5.G.1

- 5.GM.1c1 Locate the x and y axis on a graph.
- 5.GM.1c2 Locate points on a graph.
- 5.GM.1c3 Use order pairs to graph given points.
- 6.GM.1c4 Locate points on a graph.
- 6.GM.1c5 Use order pairs to graph given points.

5.G.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation. Classify two-dimensional figures into categories based on their properties.

CCCs linked to 5.G.2

6.GM.1c6 Find coordinate values of points in the context of a situation.

Classify two-dimensional figures into categories based on their properties.

5.G.3 Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

CCCs linked to 5.G.3

5.GM.1a1 Recognize properties of simple plan figures.

5.G.4 Classify two-dimensional figures in a hierarchy based on properties.

CCCs linked to 5.G.4

5.GM.1b1 Distinguish plane figures by their properties.