Elementary Mathematics 2015-2016

K Grade

CANYONS School District

TABLE OF CONTENTS

ELEMENTARY MATH CURRICULUM MAP
CANYONS SCHOOL DISTRICT
2015-2016

Curriculum Mapping Purpose

Canyons School District's curriculum math maps are standards-based maps driven by the Utah Core State Standards for Mathematics and implemented using Pearson enVisionMATH ©2012. Student achievement is increased when both teachers and students know where they are going, why they are going there, and what is required of them to get there. Additional instructional days were intentionally built into the map to allow teachers to go into more depth on concepts. Supporting resources for these additional days can be found in the General Information section.

Curriculum Maps are a tool for:

- **ALIGNMENT:** Provides support and coordination between concepts, skills, standards, curriculum, and assessments
- **COMMUNICATION:** Articulates expectations and learning goals for students
- **PLANNING:** Focuses instruction and targets critical information
- **COLLABORATION:** Promotes professionalism and fosters dialogue between colleagues about best practices in both instruction and assessment.
- **SCAFFOLDED INSTRUCTION AND GROUPING STRUCTURES:** The organization of a scaffolded classroom includes whole group, small group (e.g., teacher-led skill-based, cooperative learning), partner, and independent work where students are provided support towards mastery. As students assume more responsibility for the learning, gradual support is decreased in order to shift the responsibility for learning from the teacher to the students.

Canyons School District elementary math maps are created by CSD elementary teachers
and published by the CSD Office of Evidence-Based Learning.

General Information

Pacing

This curriculum map provides guidance for intertwining the Utah Core Math Standards and the enVision curriculum. Following the map will allow students to access all core standards by the end of the year. To support students' mastery of the standards, targeted standards have been identified for each domain. Attending to these targeted standards will allow teachers to focus instruction for the given topic and better assess students' understanding of each standard.

Intentional Planning

For each domain, the map specifies both procedural checks and application tasks. These tasks represent what students should know and be able to do after instruction. Understanding these tasks will assist with designing instruction around targeted standards and critical areas.

- **Procedural Check***:* The purpose of the procedural check is to identify if students have the basic procedural understanding of the mathematical concept being highlighted.
- **Application Task**: The purpose of the application task is to assess student ability to understand and apply the skill with a heightened level of depth and complexity.

Critical Areas for Conceptual Understanding

In addition to targeted standards, critical areas have been identified and are highlighted in blue within the scope and sequence of the map. Students are expected to demonstrate a conceptual understanding of these critical areas in order to be prepared for future grades. Additional instructional days have been scheduled into the scope and sequence to provide additional time for increasing conceptual understanding of the standards. Conceptual understanding requires a focus of depth and complexity which may go beyond the enVision lessons. The following resources may be useful for extending instruction to address depth of knowledge demands of the standards.

Online:

Illustrative Mathematics: Mathematical tasks aligned to the standards https://www.illustrativemathematics.org

Inside Mathematics: More mathematical tasks aligned to the standards http://www.insidemathematics.org/index.php/tools-for-teachers

Illuminations: Lessons, interactives, and web links to support math instruction. http://illuminations.nctm.org

Print Resources:

Elementary and Middle School Mathematics: Teaching Developmentally by John A. Van De Walle

Investigations in Number, Data and Space (2004) (1998)

Assessment

Topic assessments are available digitally in the SuccessNet CFA accounts. The 2012 enVisionMath topic tests directly align to the scope and sequence outlined in the map. For example, at the end of every topic, there is a skill-based check and performance task that will assess students' procedural and conceptual understanding of the given topic.

Focused Review

It is critical to provide an ongoing review of previously taught concepts and skills. Teacher-directed, interactive reviews daily are ideal to assess student learning and inform instruction. Daily Common Core Review is provide daily within the enVisionMATH 2012 program and may be used to provide a cumulative review. The math block allocates 5-10 minutes for a daily, focused review.

Common Formative Assessment (CFA)

The CFA's are an informational assessment for you as a teacher. These assessments were designed to assess all depth of knowledge (DOK) levels and mastery of Utah Core Standards. They are one form of assessment and the data can be used during Instructional Problem Solving Team discussions to problem solve and inform instruction. CFAs are mandatory and should be completed within the given frame of time outlined in the curriculum map with the exception of the final CFA.

Homework

The struggle to develop new concepts should occur while the teacher is available to support and scaffold the learning and correct students' errors in thinking. Work that is sent home for students to complete should consist of concepts that have already been taught in class, been practiced, and the student can already do independently. Math homework should be used to build automaticity of skills already acquired and not for development of new skills without instruction. Practicing concepts incorrectly at home can reinforce errors in thinking and cause frustration for students and families. Practicing the skill to automaticity with homework assignments is appropriate after students

have acquired the skill. *Reflex Math* is available for students in grades 2-5 and can be accessed at home as well as at school. *Reflex* Math *helps* students develop fluency with their basic facts in addition, subtraction multiplication and division and could be assigned as homework to support students' automaticity.

Online Supports for Unpacking the Core

For additional information about teaching math standards, please visit the following websites:

USOE Curriculum Guides *http://csdmathematics.weebly.com/usoe-elementary-curriculum-guides.html*

North Carolina http://www.ncpublicschools.org/acre/standards/common-core-tools/#unpacking

Howard County Public Schools https://grade4commoncoremath.wikispaces.hcpss.org (Change grade number to match yours—grade_commoncoremath.wikispaces.hcpss.org)

Delware—Under assessment examples http://www.doe.k12.de.us/aab/Mathematics/assessment_tools.shtml

EngageNY—Mathematics Modules--http://www.engageny.org/mathematics

Kindergarten Utah State Core Math Standards At-a-Glance

Kindergarten Overview

Counting and Cardinality
(K.CC)

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

Operations and Algebraic Thinking
(K.OA)

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

Number and Operations in Base Ten
(K.NBT)

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

Measurement and Data
(K.MD)

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

Geometry
(K.G)

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

Two Critical Areas

In Kindergarten, instructional time should focus on two critical areas:

- representing, relating, and operating on whole numbers*, initially with sets of objects;
- describing shapes and space.
  - More learning time in Kindergarten should be devoted to number than to other topics.

Common Core Practice Standards

Overarching habits of mind of a productive mathematical thinker

1. Make sense of problems and persevere in solving them
6. Attend to precision

Reasoning and explaining

2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others

Modeling and using tools

4. Model with mathematics
5. Use appropriate tools strategically

Seeing structure and generalizing

7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

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 as putting together and adding to, and understand subtraction as taking apart and taking from.**

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.**

MATHEMATICAL PRACTICES

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

Counting and Cardinality K.CC

Know number names and the count sequence.

1. Count to 100 by ones and by tens.
2. Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0–20 (with 0 representing a count of no objects).

Count to tell the number of objects.

4. Understand the relationship between numbers and quantities; connect counting to cardinality.
   - **a.** When counting objects, say the number names in the standard 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.
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 1–20, count out that many objects.

Compare numbers.

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.[1]
7. Compare two numbers between 1 and 10 presented as written numerals.

Operations and Algebraic Thinking K.OA

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

1. Represent addition and subtraction with objects, fingers, mental images, drawing[2], sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
3. Decompose 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).
4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.
5. Fluently add and subtract within 5.

[1] Include groups with up to ten objects.
[2] Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)

Number and Operations in Base Ten K.NBT

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

1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects 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.

Measurement and Data K.MD

Describe and compare measurable attributes.

1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.
2. Directly compare two objects with a measurable attribute in common, to see which object 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.*

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

3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count.[3]

Geometry K.G

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

1. Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind, and next to.*
2. Correctly name shapes regardless of their orientations or overall size.
3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").

Analyze, compare, create, and compose shapes.

4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
6. Compose simple shapes to form larger shapes. *For example, "Can you join these two triangles with full sides touching to make a rectangle?"*

[3] Limit category counts to be less than or equal to 10.

Utah Core Standards for Mathematics Progressions

	Kindergarten	1st Grade
Counting and Cardinality	• Count to 100 by ones and tens • Represent and write numbers for 0 - 20 • Count to tell the number of objects • Compare numbers; greater than, less than, equal • Compare written numerals between 1 and 10	

Operations and Algebraic Thinking	• Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from
	  o Represent addition and subtraction
	  o Solve addition and subtraction word problems within 10
	  o Decompose numbers less than or equal to 10
	  o For any number from 1 to 9, find the number that makes 10 when add to the given number
	  o Fluently add and subtract within 5
		• Represent and solve problems involving addition and subtraction within 20
		• Understand and apply properties of operations and the relationship between addition and subtraction
		  o Understand subtraction as an unknown-addend problem
		• Relate addition and subtraction with 20 to counting
		• Add and subtract within 20
		• Understand the meaning of the equal sign
		• Work with addition and subtraction equations

Numbers and Operations in Base Ten	• Work with numbers 11-19 to gain foundation for place value
	  o Compose and decompose numbers
		• Read, write, count and represent to 120
		• Understand place value of tens and ones
		• Compare two-digit numbers based on tens and ones
		• Use place value understanding and properties of operations to add and subtract
		  o Add within 100
		  o Mentally find 10 more or 10 less with two-digit numbers
		  o Subtract multiples of 10 in the range of 10 -90 from multiples of 10 in the range of 10-90

Measurement and Data	• Describe and compare measureable attributes such as length and weight • Directly compare two objects with the same measurable attribute in common and describe the difference • Classify objects and count the numbers of objects in categories	• Measure lengths indirectly and by iterating lengths units • Tell and write time in hours and half-hours using analog and digital clocks • Organize, represent and interpret data up to three categories

Geometry	• Identify, name and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)
	• Identify shapes as two-dimensional or three-dimensional
	• Analyze, compare, create and compose shapes
		• Reason with shapes and their attributes
		  o Distinguish between defining vs. non-defining attributes
		  o Compose two-dimensional or three-dimensional shapes to compose and create shapes
		  o Partition circles and rectangles into two and four equal shares

Utah Core Standards for Mathematics Progressions

	2nd Grade	3rd Grade
Operations and Algebraic Thinking	• Represent and solve one- and two-step word problems involving addition and subtraction within 100 • Fluently add and subtract within 20 using mental strategies • Work with equal groups of objects to gain foundations for multiplication • Use addition to find the total number of objects in rectangular arrays with up to 5 rows and up to 5 columns	• Represent and solve problems involving multiplication and division within 100 • Understand properties of multiplication and the relationship between multiplication and division • Multiply and divide within 100 • Solve two-step word problems involving the four operations and identify and explain patterns in arithmetic

Numbers and Operations in Base Ten	• Use place value understanding and properties of operations to add and subtract within 100
	  o Count, read and write within 1000
	  o Compare three-digit numbers using symbols
		• Use place value understanding and properties of operations to perform multi-digit arithmetic
		  o Round whole numbers to nearest 10 or 100
		  o Fluently add and subtract within 1000
		  o Multiply one-digit whole numbers by multiples of 10 in range 10-90

Numbers and Operations- Fractions		• Develop understanding of fractions as numbers with denominators 2, 3, 4, 6, 8 using number lines • Explain equivalence of fractions and compare by reasoning about their size
Measurement and Data	• Measure lengths of an object by selecting and using appropriate tools in standard units. • Measure and estimate lengths using units of inches, feet centimeters and meters • Measure to determine how much longer • Relate addition and subtraction to length within 100 • Represent whole numbers as distance from 0 on the number line • Work with time on digital and analog clocks to the nearest 5 minutes • Solve word problems involving money • Represent and interpret data by measuring objects and making repeated measurements of the same object • Represent and interpret data by drawing a picture graph and a bar graph to represent a data set up to four categories	• Solve problems involving measurement and estimation of intervals of time to the nearest minute • Solve problems involving measurement and estimation of liquid volumes and masses of objects using grams, kilograms and liters • Represent and interpret data using scaled picture and bar graphs • Generate measurement data by measuring lengths to halves and fourths • 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	• Recognize and draw shapes having specified attributes • Partition a rectangle into rows and columns • Partition circles and rectangles into two, three, or four equal shares	• Understand that shapes in different categories may share attributes • Partition shapes into parts with equal areas

Utah Core Standards for Mathematics Progressions

	4th Grade	5th Grade

Operations and Algebraic Thinking	• Use the four operations with whole numbers to solve word problems
	  o Interpret a multiplication equation as a comparison
	  o Involve multiplicative comparisons
	  o Solve multistep word problems using whole numbers with whole number answers
	• Gain familiarity with factors and multiples in the range 1-100
	• Generate and analyze patterns that follow a given rule
		• Write and interpret numerical expressions
		  o Use parenthesis, brackets, or braces in numerical expressions and evaluate expression with these symbols
		  o Write simple expressions and interpret numerical expressions without evaluating them
		• Analyze patterns and relationships
		  o Generate two numerical patterns using two given rules
		  o Form ordered pairs

Numbers and Operations in Base Ten	• Generalize place value understanding for multi-digit whole numbers
	  o Read, write, compare and expand multi-digit whole numbers
	  o Round multi-digit numbers to any place
	• Fluently add and subtract multi-digit whole numbers using the
	• Use place value understanding and properties of operations to perform multi-digit multiplication
	  o Multiply up to four digits by a one-digit number
	  o Multiply two two-digit numbers using strategies and properties (illustrate and explain the calculations using equations, rectangular arrays and area models)
		• Understand the place value system
		  o Recognize a multi-digit number in the one place represents 10 times as much as it represents in the place to its right and 1/10 to its left
		  o Explain patterns when multiplying by zero and explain patterns when a decimal is multiplied or divided
		  o Use whole-number exponents to denote powers of 10
		  o Read, write and compare decimals to thousandths
		  o Round to any place
		  o Fluently multiply multi-digit whole numbers
		• Perform operations with multi-digit whole numbers and with decimal to hundredths
		  o Fluently multiply multi-digit whole numbers
		  o Find whole-number quotients of whole numbers up to four-digit dividends (illustrate and explain the calculations using equations, rectangular arrays and area models)
		  o Add, subtract, multiply, and divide decimals to hundredths

Numbers and Operations-Fractions	• Extend understanding of fraction equivalence and ordering with denominators 2,3,4,5,6,8,10,12,10
	  o Explain and generate equivalent fractions using visual models
	  o Compare with justification two fractions with different denominators and numerators and use the symbols >, =, <.
	• Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers
	  o Understand addition and subtraction of fractions as joining and separating parts referring to the same whole
	  o Decompose a fraction into a sum of fractions with same denominator
	  o Add and subtract mixed numbers with like denominators
	  o Solve word problems involving addition and subtraction of fractions having like denominators
	  o Understand a fraction a/b as a multiple of 1/b and use this understanding to multiply a fraction by a whole number
	  o Solve word problems involving multiplication of a fraction by a
		• Use equivalent fractions as a strategy to add and subtract fractions
		  o Add and subtract fractions with unlike denominators
		  o Solve word problems involving addition and subtraction of fractions with unlike denominators
		• Apply and extend previous understandings of multiplication and division to multiply and divide fractions
		  o Interpret a fraction as division of the numerator by the denominator
		  o Solve word problems involving division of whole numbers
		  o Find the are of a rectangle with fractional side lengths by tiling it with unit squares
		  o Multiply fractional side lengths to find area of rectangle to get a rectangular areas
		  o Interpret multiplication as scaling
		  o Solve real world problems involving multiplication of fractions and mixed numbers
		  o Divide a unit fraction by a whole number and whole

	whole number
	• Understand decimal notation for fractions and compare decimal fractions
	  o Express a fraction with denominator 10 as an equivalent fraction with denominator 100
	  o Use decimal notation for fractions with denominators 10 or 100
	  o Compare two decimals to hundredths by reasoning about their size
		numbers by unit fractions

Measurement and Data	• Solve problems involving measurement and conversion of measurements form a larger unit to a smaller unit
	  o Know relative sizes of measurement units within one system of units including km, m, cm; kg, g, oz; l, ml; hr, min, sec. and express measurement equivalents in terms of a smaller unit, recording measurement in a two-column table
	  o Use the four operations to solve problems involving distances, intervals of time, liquid volumes, masses of objects, and money including problems involving simple fractions or decimals
	  o Represent measurement quantities using diagrams such as number line diagrams such as number line diagrams that feature a measurement scale
	  o Apply the area and perimeter formulas in real world problems
	  o Make a line plot to display data set of measurements in fractions of a unit ($\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$)
	• Represent and interpret data by making a line plot to display data set of measurements in fractions of a unit ($\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$)
	• Understand concepts of angle and measure angles
	  o As angle is measured with reference to a circle
	  o An angle that turns through *n* one-degree is said to have an angle measure of *n* degrees
	  o Measure and sketch angles in whole-number degrees using a protractor
	  o Recognize angles measures as additive
	  o Solve addition and subtraction problems to find unknown angles
		• Convert like measurement units within a given measurement system
		• Represent and Interpret data
		  o Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}, \frac{1}{4}, \frac{1}{8}$)
		  o Use operations on fractions for this grade to solve problems from information on the line plot
		• Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
		  o Measure volume by counting unit cubes
		• Relate volume to the operations of multiplication and addition and solve real world problems involving volume
		  o Find the volume of a right triangle by packing it with unit cubes
		  o Apply formulas V=l x w x h and V= b x h
		  o Recognize volume as additive
		  o Find volume of solid figures composed of two non-overlapping right rectangular prisms

Geometry	• Draw points, lines, line segments, ray, angles (right, acute, obtuse), and perpendicular and parallel lines in two-dimensional figures
	• 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
	• Recognize a line of symmetry for a two-dimensional figure and identify line-symmetric figures and draw lines of symmetry
		• Graph points on the coordinate plane to solve real-world and mathematical problems in the first quadrant
		• Classify two-dimensional figures into categories based on their properties
		  o Understand that attributes belonging to a category of two-dimensional figures belong to all subcategories
		  o Classify two-dimensional figures in a hierarchy based on properties

CCSS WHERE TO FOCUS KINDERGARTEN MATHEMATICS

An important subset of the major work in grades K–8 is the progression that leads toward middle school algebra.

K	1	2	3	4	5	6	7	8
Know number names and the count sequence Count to tell the number of objects Compare numbers Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from Work with numbers 11-19 to gain foundations for place value	Represent and solve problems involving addition and subtraction Understand and apply properties of operations and the relationship between addition and subtraction Add and subtract within 20 Work with addition and subtraction equations Extend the counting sequence Understand place value Use place value understanding and properties of operations to add and subtract Measure lengths indirectly and by iterating length units	Represent and solve problems involving addition and subtraction Add and subtract within 20 Understand place value Use place value understanding and properties of operations to add and subtract Measure and estimate lengths in standard units Relate addition and subtraction to length	Represent & solve problems involving multiplication and division Understand properties of multiplication and the relationship between multiplication and division Multiply & divide within 100 Solve problems involving the four operations, and identify & explain patterns in arithmetic Develop understanding of fractions as numbers Solve problems involving measurement and estimation of intervals of time, liquid volumes, & masses of objects Geometric measurement: understand concepts of area and relate area to multiplication and to addition	Use the four operations with whole numbers to solve problems Generalize place value understanding for multi-digit whole numbers Use place value understanding and properties of operations to perform multidigit arithmetic Extend understanding of fraction equivalence and ordering Build fractions from unit fractions by applying and extending previous understandings of operations Understand decimal notation for fractions, and compare decimal fractions	Understand the place value system Perform operations with multi-digit whole numbers and decimals to hundredths 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 Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition Graph points in the coordinate plane to solve real-world and mathematical problems*	Apply and extend previous understandings of multiplication and division to divide fractions by fractions Apply and extend previous understandings of numbers to the system of rational numbers Understand ratio concepts and use ratio reasoning to solve problems Apply and extend previous understandings of arithmetic to algebraic expressions Reason about and solve one-variable equations and inequalities Represent and analyze quantitative relationships between dependent and independent variables	Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers Analyze proportional relationships and use them to solve real-world and mathematical problems Use properties of operations to generate equivalent expressions Solve real-life and mathematical problems using numerical and algebraic expressions and equations	Work with radical and integer exponents Understand the connections between proportional relationships, lines, and linear equations** Analyze and solve linear equations and pairs of simultaneous linear equations Define, evaluate, and compare functions Use functions to model relationships between quantities

* Indicates a cluster that is well thought of as a part of a student's progress to algebra, but that is currently not designated as major by the assessment consortia in their draft materials. Apart from the one asterisked exception, the clusters listed here are a subset of those designated as major in the assessment consortia's draft documents.
** Depends on similarity ideas from geometry to show that slope can be defined and then used to show that a linear equation has a graph which is a straight line and conversely.

The Utah Core 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.

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

2. Reason abstractly and quantitatively.

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

4. Model with mathematics.

5. Use appropriate tools strategically.

6. Attend to precision.

7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

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

"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" (CCSS, 2010).

Common Core State Standards
Standards for Mathematical Practice
Questions for Teachers to Ask

Make sense of problems and persevere in solving them	Reason abstractly and quantitatively	Construct viable arguments and critique the reasoning of others	Model with mathematics
Teachers ask: • What is this problem asking? • How could you start this problem? • How could you make this problem easier to solve? • How is ___'s way of solving the problem like/different from yours? • Does your plan make sense? Why or why not? • What tools/manipulatives might help you? • What are you having trouble with? • How can you check this?	*Teachers ask:* • What does the number ____ represent in the problem? • How can you represent the problem with symbols and numbers? • Create a representation of the problem.	*Teachers ask:* • How is your answer different than _____'s? • How can you prove that your answer is correct? • What math language will help you prove your answer? • What examples could prove or disprove your argument? • What do you think about _____'s argument • What is wrong with ____'s thinking? • What questions do you have for ____? **it is important that the teacher poses tasks that involve arguments or critiques*	*Teachers ask:* • Write a number sentence to describe this situation • What do you already know about solving this problem? • What connections do you see? • Why do the results make sense? • Is this working or do you need to change your model? **It is important that the teacher poses tasks that involve real world situations*
Use appropriate tools strategically	**Attend to precision**	**Look for and make use of structure**	**Look for and express regularity in repeated reasoning**
Teachers ask: • How could you use manipulatives or a drawing to show your thinking? • Which tool/manipulative would be best for this problem? • What other resources could help you solve this problem?	*Teachers ask:* • What does the word ____ mean? • Explain what you did to solve the problem. • Compare your answer to _____'s answer • What labels could you use? • How do you know your answer is accurate? • Did you use the most efficient way to solve the problem?	*Teachers ask:* • Why does this happen? • How is ____ related to ____? • Why is this important to the problem? • What do you know about ____ that you can apply to this situation? • How can you use what you know to explain why this works? • What patterns do you see? **deductive reasoning (moving from general to specific)*	*Teachers ask:* • What generalizations can you make? • Can you find a shortcut to solve the problem? How would your shortcut make the problem easier? • How could this problem help you solve another problem? **inductive reasoning (moving from specific to general)*

CSD Math Block 30 Minutes Daily

Math Practices

- ✓ Provide realistic problems and real-world contexts
- ✓ Create Language-rich classroom routines
- ✓ Incorporate high-order thinking through questioning
- ✓ Increase the use of measurement
- ✓ Build from graphs, charts, and tables – Milk the data
- ✓ Develop number sense at every opportunity
- ✓ Have students visualize, draw, and model concepts
- ✓ Increase opportunities to respond and feedback

Numeracy Component	Range of Time	Focus of Instruction		Instructional Materials

Whole Group Time
Review or Pre-teach
	2 minutes	• Focused Review
		  ○ Identified skill deficit that have been identified through formative assessment (CFA, exit ticket, whiteboards, etc.)
		• Pre-teach upcoming concepts that have proven to be difficult in the past
			• **Check for Understanding (Assessment)**
			  ○ **Monitor progress** towards mastery of grade-level core standards
				• Daily Common Core Review

Lesson Objectives	1-3 minutes	• Content Objectives- What are students going to learn? • Language Objectives- How will students demonstrate learning through reading, writing, speaking, or listening?		• Quick and Easy Lesson Overview states objective
Whole Group Time **Vocabulary and Fluency Practice**	5 minutes	• Teach appropriate vocabulary • Build fluency with math skills		• Vocabulary Word Cards • Topic Digital Path

Table Time
Concept/Skill Development and Application
	10 minutes	Develop the Concept:
		• Acquisition: Students develop understanding of skills through the CRA Model
		  ○ Concrete: Hands-on (manipulatives)
		  ○ Representational: Visual (pictures or video)
		  ○ Abstract: Symbolic (numbers or algorithm)
		• Automaticity: Students perform skills flexibly, accurately, and efficiently
		• Application: Students apply skills to solve problems in new contexts
				• Problem-Based Interactive Learning
				• Visual Learning Bridge
				• Guided Practice

Small Group Time **Independent Practice and/or Small Group: Reteach or Extend**	10 minutes	• Students practice concept independently as appropriate • Reteach with skill-based groups who need extra support/scaffolding • Provide extension opportunities for students who have shown mastery of the concept/skill • Build Fluency with math skills		• Problems from Independent Practice and Problem Solving • Practice, Reteach, and Enrichment pages • Differentiated Center materials • Close/Assess and Differentiate • Math Diagnosis and Intervention System

CSD Kindergarten Math Block 75 Minutes Daily

Math Practices

- ✓ Provide realistic problems and real-world contexts
- ✓ Create Language-rich classroom routines
- ✓ Incorporate high-order thinking through questioning
- ✓ Increase the use of measurement
- ✓ Build from graphs, charts, and tables – Milk the data
- ✓ Develop number sense at every opportunity
- ✓ Have students visualize, draw, and model concepts
- ✓ Increase opportunities to respond and feedback

Numeracy Component	Range of Time	Focus of Instruction		Instructional Materials

Whole Group Time Review or Pre-teach	5-10 minutes	• Focused Review
		  ○ Identified skill deficit that have been identified through formative assessment to review (CFA, exit ticket, whiteboards, etc.)
		  ○ Cumulative review of previously taught skills and standards
			• **Check for Understanding (Assessment)**
			○ **Monitor progress** towards mastery of grade-level core standards
				• Daily Common Core Review

Lesson Objectives	1-3 minutes	• Content Objectives- What are students going to learn? • Language Objectives- How will students demonstrate learning through reading, writing, speaking, or listening?		• Quick and Easy Lesson Overview States Objective
Whole Group Time **Vocabulary and Fluency Practice**	10-15 minutes	• Teach appropriate vocabulary • Build Fluency with math skills		• Vocabulary Word Cards • Topic Digital Path

Table Time
Concept/Skill Development and Application
	20-25 minutes	Develop the Concept:
		• Acquisition: Students develop understanding of skills through the CRA Model
		  ○ Concrete: Hands-on (manipulatives)
		  ○ Representational: Visual (pictures or video)
		  ○ Abstract: Symbolic (numbers or algorithm)
		• Automaticity: Students perform skills flexibly, accurately, and efficiently
		Application: Students apply skills to solve problems in new contexts
				• Problem-Based Interactive Learning
				• Visual Learning Bridge
				• Guided Practice

Small Group Time **Independent Practice and/or Small Group: Reteach or Extend**	15-20 minutes	• Students practice concept independently as appropriate • Reteach with skill-based groups who need extra support/scaffolding • Provide extension opportunities for students who have shown mastery of the concept/skill • Build Fluency with math skills		• Problems from Independent Practice and Problem Solving • Practice, Reteach, and Enrichment pages • Differentiated Center materials • Close/Assess and Differentiate • Math Diagnosis and Intervention System

Evidence-Based Instructional Priorities
Applied to Math Instruction

Explicit Instruction

I Do - We Do - Y'all Do - You Do
Model - Guide Practice – Partner - Independent

Systematic

- ❑ Focused on critical content
- ❑ Vocabulary routine
- ❑ Skills, strategies, and concepts are sequenced logically
- ❑ Break down complex skills
- ❑ Lessons are organized and focused
- ❑ Instructional routines are used
- ❑ Examples and non-examples
- ❑ Step-by-step demonstrations
- ❑ C-R-A Model

Relentless

- ❑ Adequate initial practice
  NOTE: Students who struggle may require 10-30 more times as many practice opportunities than their peers.
- ❑ Distributed practice--frequent exposure to content/skill over time
- ❑ Daily focused review
- ❑ Daily focus on number sense and problem solving
- ❑ Teach to mastery
- ❑ Cumulative review periodically

Engaging

- ❑ Classroom Positive Behavioral Interventions and Supports (PBIS)
- ❑ Feedback Cycle
- ❑ Scaffolded Instruction & Grouping Structures
- ❑ Acquisition, Automaticity, Application (AAA)
- ❑ Maximizing Opportunities to Respond (OTR)
- ❑ Create various contexts for problem solving that students can relate to
- ❑ Pacing

Increasing Opportunities to Respond

Saying, Writing, Doing

- ❑ **Choral Responses:** give think time, use a signal for response, repeat if all students don't respond
- ❑ **Partner Sharing**: Look-Lean-Whisper; Think-Pair-Share; Study-Tell-Help-Check
- ❑ **Individual Responses:** give wait time, individual shares after partner discussion, Cold Call, random calling pattern
- ❑ **Math Journals:** Quick Writes, vocabulary practice, draw visuals of math concepts
- ❑ **Individual White Boards**: use a signal for displaying, establish a routine, provide feedback
- ❑ **Manipulatives**: establish a routine, explain expectations, all students interact with materials, provide visual bridge to concept
- ❑ **Response Cards**: red/green, yes/no; odd/even; +/-; </>/=; etc.
- ❑ **Action Responses**: thumbs up/down; modeling operations, angles, or other math concepts, act it out, hand signals

Systematic Vocabulary Instruction Routine

- ❑ **Introduce the word**
  - Teacher says the word and posts the word
  - All students repeat the word
  - Teacher gives a child-friendly definition
  - All students repeat the definition (with teacher guidance)
  - Repeat above steps as necessary
- ❑ **Demonstrate**
  - Provide an example
  - Provide a non-example
  - Repeat above steps as necessary
- ❑ **Apply**
  - Students turn to a partner and use the word in a sentence
  - Teacher shares a sentence using the word
- ❑ **Vocabulary Cards:** Grade-level vocabulary cards available on the CSD math website; utilized during instruction and posted on Word Wall

Feedback Cycle

- ❑ Corrective and Affirmative
- ❑ Timely and Frequent
- ❑ Specific and Reinforcing

Scaffolded instruction and Grouping

- ❑ Whole group, Small groups, Partners
- ❑ Fluid and flexible
- ❑ Skill-Based Small Group Instruction for identified skill gaps or extension

Acquisition – Automaticity – Application

- ❑ Learn (acquire) the skill
- ❑ Build the skill to automaticity
- ❑ Attend to fluency standards in the core
- ❑ Apply the skill

Classroom PBIS

- ❑ Forming clear behavior expectations
- ❑ Explicitly teaching expectations to students
- ❑ Reinforcing expectations with students
- ❑ Correcting of problem behaviors in a systematic manner

Systematic Vocabulary Routine- Math

Acquisition (DOK 1)	**Introduction Phase** 1. Teacher writes/says the word. 2. Students repeat the word. 3. Multisyllabic breakdown 4. Teacher gives a student friendly definition, incorporating synonyms as appropriate. 5. Students restate definition with teacher guidance. 6. Teacher identifies any prefixes, suffixes, base/root words, origin, etc.	**Teacher/Student Responsibilities** T: The word is polygon. What word? S: polygon T: Let's clap/tap "polygon" into syllables. T & S: "pol" "y" "gon". T: How many syllables? S: 3 syllables T: A closed plane figure with three or more sides that is made up of line segments that do not cross. T & **S**: A closed plane figure with three or more sides that is made up of line segments that do not cross is called a _____. T: The prefix "poly" means much or many. So a polygon has not just one side, but many sides.
Building Automaticity (DOK 2)	**Demonstration Phase** 7. Illustrate with examples/non-examples a) Concrete examples (*realia*) b) Visual representations—video, pictures, diagrams, etc. c) Physical gesture d) Verbal Examples e) Sentence Frames (ex. If I had to survive cold weather, I would need _____. 8. Check for students' understanding by discerning between examples and non-examples (repeat as necessary)	T: Look at the figures on this picture. This figure is a polygon because it is closed figure, it is made of line segments that do not cross. These figures are not polygons because they have curved lines, they are open, and some have crossed lines. T: (Example) Draw a polygon on the board? Ones tell your partner if this is a polygon and explain why or why not. S1: The figure is a polygon because it has line segments that are closed and they do not cross. T: (Non-example) Draw a figure that is not a polygon on the board. Twos tell your partner if this is a polygon and explain why or why not. S2: The figure is not a polygon because it is made of curved lines and it is also not closed.
Application (DOK 3)	**Application Phase** 9. Deepen students' understanding by applying the word in a new context a) Teacher asks a deep processing question b) Students respond via a quick write and/or orally with a partner or in a small group or whole group setting.	• Students use the word in a sentence. The sentence must be at least five words long. • Number 2's will say the sentence while number 1's count the words in the sentence and makes sure the sentence is a true statement. They switch and follow the same procedure.

Skill-Based Instruction: Assisting All Students to Succeed in Mathematics

Skill-Based Instruction is additional assistance given to students during the math block by the teacher aimed at building targeted math skills. This is in addition to core instruction given to entire class. Skill-Based instruction is explicit and systematic using the *I do, we do, y'all do, and you do* model.

Suggestions for forming fluid skill-based groups:

- Data from formative assessments (exit ticket, Quick Check, Daily Common Core Review, white board check, etc.)
- Topic test from enVision
- District Common Formative Assessment (CFA)
- Team created CFA

enVision supports:

- *Intervention* portion of the Differentiated Instruction at the end of each lesson
- *Reteaching* opportunities written into the margins of each lesson
- *Differentiated Instruction* can also be found at the beginning of each topic
- *Reteaching* pages at the end of each topic
- If…. Then…. found in the margins throughout the enVision lessons

Teacher actions during skill-based instruction with the small group:

- ☐ Concrete models with teacher think-alouds
- ☐ Connections between abstract symbols and visual representations
- ☐ Numerous example problems with teacher think-alouds
- ☐ Opportunities for students to solve problems in a group and communicate strategies
- ☐ Specific feedback to students to clarify understanding
- ☐ Frequent cumulative review
- ☐ Opportunities for students to apply the skills in word problems

Teacher Actions During Skill-Based Instruction with the Small Group	Examples
Provide additional concrete models to build understanding with accompanying teacher think-alouds	• Use manipulatives such as place value blocks, Unifix cubes, and fraction circles. • Use visual representations such as number lines, arrays, and bar diagrams. • Teacher Think-Aloud: *"When I have fourteen cubes, I can create one ten stick and I have four cubes left over to make 14."*
Provide students opportunities to understand the relationship between the abstract symbols and visual representations.	• The = sign means that we have the same amount on both sides of the equal sign. ✪ ✪ ✪ = ✪ ✪ ✪
Provide numerous examples with accompanying teacher think-alouds	Skill: Addition of Fractions Examples: • ½ + ¼ = • ¼ + ¼ = Teacher Think-Aloud: *"We know that when we add fractions with common denominators the denominator will stay the same because we still have the same size piece. So when I add ¼ + ¼ I have $^2/_4$ because I have 2, ¼ pieces."*
Provide students with opportunities to solve problems in a group and communicate problem-solving strategies.	• Students effectively communicate their strategies to *one another* using appropriate mathematical vocabulary. • Students effectively communicate their strategies to the *teacher* using appropriate mathematical vocabulary.
Provide students ongoing, specific feedback that clarifies what students did correctly or what they need to improve.	• Student correctly answers that 5 + 3 = 8. Teacher says, "Yes, that is correct. The total of five and three is eight." • Student incorrectly identifies that 5 + 3 = 7. Teacher says, "Five plus three is not seven. Pull out your unifix cubes and show me the problem with your cubes." *Student counts the cubes and answers that 5 + 3 = 8.* "That is correct. The total of five and three is eight. Thank you for trying again."
Provide frequent cumulative review to ensure that knowledge is maintained over time.	Skill: Adding Decimals • Teacher quickly reviews multi-digit addition with an emphasis on place value.
Provide opportunity for students to apply the skill in word problems.	Skill: Area - finding the area of a rectangle given the side lengths. • Students create word problems using the area of squares for example a student creates the following problem, *"Bobbie is tiling the kitchen floor with square foot tiles. The floor has side lengths of 10 feet and 12 feet. How many tiles are needed to cover the floor?"*

During skill-based instruction, students not with the teacher could engage in the following station activities:

Station Options	Description
Center Activities from enVision	• At the end of each enVision lesson are Differentiated Instruction page, which includes both On-Level and Advanced Center Activities.
Fluency	• Fluency is built on any skill that has been taught throughout the year (*e.g., previous instruction focused on fact families and pairs of students work together and to create fact families using number cards, including numbers 0-9. The student created fact families would be recorded on a piece of paper or graphic organizer.)* •
Four-Square Math	• Students are given a four square graphic organizer with a previously learned vocabulary word or concept in the middle of the graphic. The four areas to write could include any of the following: three words or pictures that help you remember the word, characteristics, non-example, example, a statement that is true about the word, three words related to the word, or a conclusion statement.
Literature in Math	• Students read or look at a book that relates to the current or past math concept. The teacher provides questions or sentence starters for the group at the station to support discussion after reading.
Manipulatives	• Students manipulate math tools to complete a grade level task.
Math Journals	• Students write or draw in math journals to summarize their learning. • Students review their notes and star key ideas.
Problem-Solving using DOK 3	• Students in small groups are presented with an application problem that requires reasoning, problem solving, and justification of their thought process by using words, pictures or equations. • Tasks are available at the following websites: http://www.insidemathematics.org https://www.illustrativemathematics.org http://illuminations.nctm.org
Reflex	• Students work independently in grades 2-5 build fluency of basic facts using the internet based Reflex program.
Technology	• Students use appropriate technology to further their understanding of math.
Vocabulary	• Students match previously taught vocabulary words with illustrations. After finding a match the student would define the word. • Students do a word sort with the vocabulary words. • Students find similarities and differences in words using a Venn Diagram.

Kindergarten
Year-at-a-Glance 2015-2016

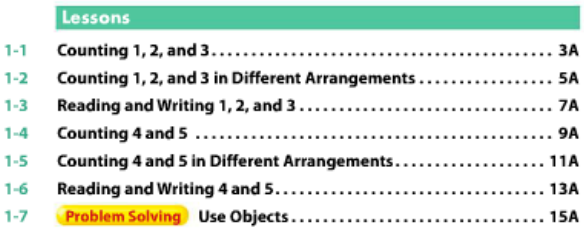
Month	Math Topics	TOPICS from enVision 2012	CFA Assessment Dates
August 24-October 30 (44 days)	• **One to Five**	Topic 1	Due by October 30th
	• **Comparing and Ordering Numbers 0 to 5**	Topic 2	
	• **Six to Ten**	Topic 3	
	• **Comparing and Ordering Numbers 0 to 10**	Topic 4	
	• **Numbers to 20**	Topic 5	
November 2-January 15 (41 days)	• **Numbers to 100**	Topic 6	Due by January 15th
	• **Understanding Addition**	Topic 7	
	• **Understanding Subtraction**	Topic 8	
January 19-April 1 (49 days)	• **Composing and Decomposing Numbers to 10**	Topic 9	Due by April 1st
	• **Composing Numbers 11 to 19**	Topic 10	
	• **Decomposing Numbers 11 to 19**	Topic 11	
	• **Measurement**	Topic 12	
	• **Sorting, Classifying, Counting and Categorizing Data**	Topic 13	
April 11-June 3 (37 days)	• **Identifying and Describing Shapes**	Topic 14	Due by June 3rd
	• **Position and Location of Shapes**	Topic 15	
	• **Analyzing, Comparing and Composing Shapes**	Topic 16	

CFA 1: August 24-October 30 **Flexible Pacing: 44 days**

Domain: Counting and Cardinality

One to Five

Report Card Learning Targets **I can….** • Represent and write numbers from 0-20 • Count to tell the number of objects		
Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.CC.3	Students will count sets of objects, identify the quantity, and associate a numeral card with the set. Students will begin at one and write the numbers 1-5 (DOK 1)	Students are given several sets of random quantities from 1- 5. Students are asked to identify the quantity of each set and match a numeral card to show the value of each set. (DOK 1)
K.CC.4	Place a set of objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 2. Then add one more and tell you how many. Repeat with sets of 3 – 5. (DOK 1)	I have this many erasers in my pocket. Please count and tell me how many erasers I have. (Teacher places 5 erasers before the students.) Sara needs to borrow 4 erasers. Count out 4 erasers for me to give to her. (DOK 1)
K.CC.5	Teacher provides students with concrete and/or pictorial objects to find "how many" in a given set from 1-5. Teacher provides students with concrete and/or pictorial objects arranged in a line, rectangular array or circle from 1-5 in a given set. (DOK 1)	Student uses counting strategies to find "how many" concrete objects in a given set from 1-5. Students are given pictorial representation of objects from 1- 5 arranged in a line, rectangular array. Student's use practiced counting strategies to find "how many" in a given set. (DOK 1)

	Domain – Counting and Cardinality	Curriculum Supports	Vocabulary
K.CC.3	**Know number names and the count sequence.** **3**. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	**enVision 2012** **Topic 1 – One to Five** **1-1** Counting 1,2, & 3 **1-2** Counting 1,2,3 in Different Arrangements **1-3** Reading and Writing 1,2, and 3 **1-4** Counting 4 & 5 **1-5** Counting 4 & 5 in Different Arrangements **1-6** Reading and Writing 4 & 5 **1-7** Problem Solving: Use Objects	**K.CC.3** set, numeral, number, number names zero to twenty, quantity, order
K.CC.4	**Count to tell the number of objects.** **4**. Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard 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.	 Lessons 1-1 Counting 1, 2, and 3 ..... 3A 1-2 Counting 1, 2, and 3 in Different Arrangements ..... 5A 1-3 Reading and Writing 1, 2, and 3 ..... 7A 1-4 Counting 4 and 5 ..... 9A 1-5 Counting 4 and 5 in Different Arrangements ..... 11A 1-6 Reading and Writing 4 and 5 ..... 13A 1-7 Problem Solving Use Objects 15A	**K.CC.4** numeral, number, number names, "how many," count, "one more," quantity, set, objects
K.CC.5	**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 1-20, count out that many objects.		**K.CC.5** count, set, objects, array, number line, scattered, how many, order

	Additional Assessment Options	• **Topic 1 Test- One to Five** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- One to Five** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 1: August 24-October 30 **Flexible Pacing: 44 days**

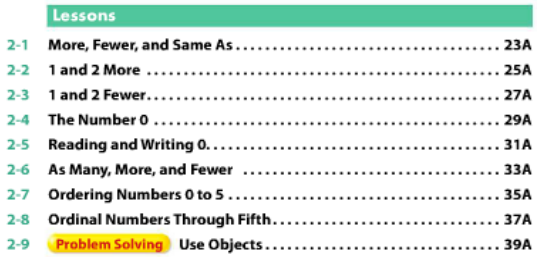
Domain: Counting and Cardinality
Comparing and Ordering 0 to 5

Report Card Learning Targets
I can….

- Represent and write numbers from 0-20
- Count to tell the number of objects
- Compare numbers between 1 and 10

Assessment Tasks

	Skill-Based Check	**Performance Task**
K.CC.3	Students will count sets of objects, identify the quantity, and associate a numeral card with the set. Students will write the numbers 0-5. (DOK 1)	Give the student a set of 4 objects in a scattered arrangement. Say: *How many do you think there are?* *Now count to see how many there are.* *How many are there? Write the number on this piece of paper.* Repeat with 0- 5 objects in a scattered arrangement. (DOK 2)
K.CC.4	Place a set of objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 4. Then add one more and tell you how many. Repeat with set of 5. (DOK 1)	Give student a set of 3 cubes to count. Say: *Count to see how many you have.* Add 1 more cube to the set. Ask: *How many do I have now?* Add I more. Ask: *How many now?* (DOK 1)
K.CC.5	Teacher provides students with concrete and/or pictorial objects to find "how many" in a given set from 0-5. Teacher provides students with concrete and/or pictorial objects arranged in a line, rectangular array or circle from 0-5 in a given set. (DOK 1)	Use the same collection of 5 objects and scatter them on the table in front of the student. Say: *How many do you think there are?* *Count to see how many. How many are there?* (DOK 1)
K.CC.6	*There are some green cubes in this set and some yellow cubes in this set. Find how many green cubes there are? Find out how many yellow cubes there are?* (DOK 1)	Give the student a set of 4 green cubes and a set of 3 yellow cubes. Ask: *There are some green cubes in this set and some yellow cubes in this set. How many green cubes are there? How many yellow cubes are there?* *Which set has fewer or is there same amount of cubes in each set? How do you know?* (DOK 3)

	Domain – Counting and Cardinality	Curriculum Supports	Vocabulary
K.CC.3	**Know number names and the count sequence.** 3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	**enVision 2012** **Topic 2: Comparing and Ordering 0 to 5** **2-1** More, Fewer, and Same As **2-2** 1 and 2 More **2-3** 1 and 2 Fewer **2-4** The Number 0 **2-5** Reading and Writing 0 **2-6** As Many, More, and Fewer **2-7** Ordering Numbers 0 to 5 **2-8** Ordinal Numbers Through Fifth **2-9** Problem Solving: Use Objects	**K.CC.3** set, numeral, number, number names zero to twenty, quantity, order
K.CC.4	**Count to tell the number of objects.** 4. Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard 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.	 Lessons 2-1 More, Fewer, and Same As ..... 23A 2-2 1 and 2 More ..... 25A 2-3 1 and 2 Fewer ..... 27A 2-4 The Number 0 ..... 29A 2-5 Reading and Writing 0 ..... 31A 2-6 As Many, More, and Fewer ..... 33A 2-7 Ordering Numbers 0 to 5 ..... 35A 2-8 Ordinal Numbers Through Fifth ..... 37A 2-9 Problem Solving Use Objects 39A	**K.CC.4** numeral, number, number names, "how many," count, "one more," quantity, set, objects
K.CC.5	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 1-20, count out that many objects. **Compare numbers.**		**K.CC.5** count, set, objects, array, number line, scattered, how many, order
K.CC.6	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.[1]		**K.CC.6** more, less, fewer, same, equal, greater than, less than, most, least

	Additional Assessment Options	• **Topic 2 Test- Comparing and Ordering 0 to 5** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment Comparing and Ordering 0 to 5** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 1: August 24-October 30 **Flexible Pacing: 44 days**

Domain: Counting and Cardinality

Six to Ten

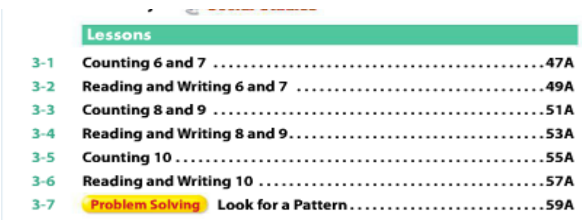
Report Card Learning Targets

I can….

- Represent and write numbers from 0-20
- Count to tell the number of objects

Assessment Tasks

	Skill-Based Check	**Performance Task**
K.CC.3	Students will count sets of objects, identify the quantity, and associate a numeral card with the set. Students will begin at one and write the numbers 6-10 (DOK 1)	Give the student a set of 6 objects in a scattered arrangement. Say: *How many do you think there are?* *Now count to see how many there are.* *How many are there? Write the number on this piece of paper.* Repeat with 7 - 10 objects in a scattered arrangement. (DOK 3)
K.CC.4	Place a set of objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 6. Then add one more and tell you how many. Repeat with sets of 6 - 10. (DOK 1)	Give student a set of 6 cubes to count. Say: *Count to see how many you have.* Add 1 more cube to the set. Ask: *How many do I have now?* Add I more. Ask: *How many now?* Continue until there are 10 cubes. (DOK 2)
K.CC.5	Teacher provides students with concrete and/or pictorial objects to find "how many" in a given set from 6 - 10. Teacher provides students with concrete and/or pictorial objects arranged in a line, rectangular array or circle from 6-10 in a given set. (DOK 1)	Use the same collection of 6 objects and scatter them on the table in front of the student. Say: *How many do you think there are?* *Count to see how many. How many are there?* Repeat with a set of up to 10 objects scattered on the table. Say: *How many do you think there are? Count to see how many. How many are there?* (DOK 2)

	Domain – Counting and Cardinality	Curriculum Supports	Vocabulary
K.CC.3	**Know number names and the count sequence.** 3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	**enVision 2012** **Topic 3: Six to Ten** **3-1** Counting 6 and 7 **3-2** Reading and Writing 6 and 7 **3-3** Counting 8 and 9 **3-4** Reading and Writing 8 and 9 **3-5** Counting to 10 **3-6** Reading and Writing 10 **3-7** Problem Solving: Look for a Pattern  Lessons 3-1 Counting 6 and 7 .... 47A 3-2 Reading and Writing 6 and 7 .... 49A 3-3 Counting 8 and 9 .... 51A 3-4 Reading and Writing 8 and 9 .... 53A 3-5 Counting 10 .... 55A 3-6 Reading and Writing 10 .... 57A 3-7 Problem Solving Look for a Pattern 59A	<u>**K.CC.3**</u> set, numeral, number, number names zero to twenty, quantity, order
K.CC.4	**Count to tell the number of objects.** 4. Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard 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.		<u>**K.CC.4**</u> numeral, number, number names, "how many," count, "one more," quantity, set, objects
K.CC.5	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 1-20, count out that many objects.		<u>**K.CC.5**</u> count, set, objects, array, number line, scattered, how many, order
	Additional Assessment Options	• **Topic 3: Six to Ten** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 3 Six to Ten** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 1: August 24-October 30 **Flexible Pacing: 44 days**

Domain: Counting and Cardinality

Comparing Numbers 0 to 10

Report Card Learning Targets **I can….** Count to 100 by ones and tens Count to tell the number of objects		
Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.CC.2	Have the student orally count from a given number (e.g., "Start at six and count until I tell you to stop"). Have the student stop at 10. Have the student orally count from a given number (e.g., "Start at 3 and count until I tell you to stop"). (DOK 2)	Lisa has 4 shirts. She bought 6 more. Count on to see how many shirts she has now. Draw a picture and show me how many she has now. (DOK 2)
K.CC.4 c	Place a set of objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 10. Then add one more and tell you how many. (DOK 1)	I have this many pennies in my pocket. Please count and tell me how many pennies I have. (Teacher places 10 pennies before the students.) Mr. Lincoln needs to borrow 10 erasers. Count out 10 erasers for me to give to him. (DOK 1)
K.CC.6	Show the students two groups of cubes and have them identify which group has more and which group has less. Show students a pictograph and have them identify which group has greater, which group has fewer, and which groups are the same. (DOK 2)	Jim has 3 dogs. Marci has 2 dogs. Who has the most dogs? Use a picture or number sentence to show how you came up with the answer. Hyrum has 7 gumballs. Lucy has 6. Mario has 7. Which students have the same number of gumballs? Justify your answer with a picture, with objects, or in writing. Janice ate 4 cookies. Sasha ate 9 cookies. Which child ate fewer cookies? Show how you came up with your answer using objects, a picture, or writing. (DOK 2)

K.CC.7	Students will be provided with a teacher-generated numeral comparison grid. 2 5 9 7 10 1 6 4 8 3 5 6 (DOK 1)	Students will identify the specified numeral. Students will touch or draw a circle around the numeral determined by teacher direction (e.g., circle the greater numeral, touch the lesser numeral). Student will say, "5 is greater than 2". (DOK 1).
OA.1	Use the linking cubes and show me the following story: Sam has 5 apples. Molly gave Sam 3 more apples. How many apples does Sam have now? (DOK 1)	Provide materials to the student. Read the problem to the student: Sam has 4 cars. Molly gave Sam 3 more cars. How many cars does Sam have now? *Show your thinking with objects or pictures*. (DOK 2)

	Domain – Counting and Cardinality	Curriculum Supports	Vocabulary
K.CC.2 **K.CC.4** **K.CC.6** **K.CC.7**	**Know number names and the count sequence.** Count forward beginning from a given number within the known sequence (instead of having to begin at one). **Count to tell the number of objects.** 4. Understand the relationship between numbers and quantities; connect counting to cardinality. c. Understand that each successive number name refers to a quantity that is one larger. **Compare numbers.** 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. Include groups with up to ten objects. Compare two numbers between 1 and 10 presented as	**enVision 2012** **Topic 4: Comparing Numbers Through Ten** **4-1** Comparing Numbers through 10 **4-2** Comparing Numbers to 5 **4-3** Comparing Numbers to 10 **4-4** 1 More **4-5** 1 Fewer **4-6** 2 More **4-7** 2 Fewer **4-8** Ordering Numbers Through 10 **4-9** Ordering Numbers on a Number Line **4-10** Problem Solving: Use Objects Lessons 4-1 Comparing Numbers Through 10 ....67A 4-2 Comparing Numbers to 5 ....69A 4-3 Comparing Numbers to 10 ....71A 4-4 1 More ....73A 4-5 1 Fewer ....75A 4-6 2 More ....77A 4-7 2 Fewer ....79A 4-8 Ordering Numbers Through 10 ....81A 4-9 Ordering Numbers on a Number Line ....83A 4-10 Problem Solving Use Objects 85A	**K.CC.2** count, number names from 1-100, counting on, order, ones, before, after, in all, how many **K.CC.4** numeral, number, number names, "how many," count, "one more," quantity, set, objects **K.CC.6** numeral, identify, visually, symbol, more, less, compare, sets,

OA.1	written numerals. **Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.** Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.		greater than, less than, more, less **K.CC.7** numeral, identify, visually, symbol, more, less, compare, sets, greater than, less than, more, less **K.OA.1** join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart
	Additional Assessment Options	• **Topic 4: Comparing Numbers Through Ten** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 4 Comparing Numbers Through Ten** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 1: August 24-October 30 **Flexible Pacing: 44 days**

Domain: Counting and Cardinality & Numbers and Operations Base Ten

Numbers to 20

I Can…

- Count to 100 by ones and tens
- Represent and write numbers from 0-20
- Count to tell the number of objects
- Make or break apart numbers from 11-19 into tens and ones

Assessment Tasks

	Skill-Based Check	**Performance Task**
K.CC.2	Have the student orally count from a given number (e.g., "Start at six and count until I tell you to stop"). Count up to 20. (DOK 1)	Kwan had 11 marbles. On his birthday his brother gave him 5 more. Count on to determine how many marbles Kwan has all together. Draw me a picture of how many marbles Kwan has in all. (DOK 2)
K.CC.3	Students will count sets of objects, identify the quantity, and associate a numeral card with the set. Students will begin at zero and write the numbers 0-20 in sequential order. (DOK 1)	Students are given several sets of random quantities from 0- 20. Students are asked to identify the quantity of each set and match a numeral card to show the value of each set. Students are given a 21-grid to write the numerals 0-20 in sequential order. (DOK 2)
K.CC.4b	Place a set of objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 20. Then add one more and tell you how many. (DOK 1)	Give student a set of 11 cubes to count. Say: *Count to see how many you have*. Add 1 more cube to the set. Ask: *How many do I have now?* Add I more. Ask: *How many now?* Continue until there are 20 cubes. (DOK 1)

K.NBT.1	Students will correctly model the numbers 11-19 using objects and pictorial representations. Students will write an equation for a given number from 11-19. Students will be able to count from 1-19. (DOK 2)	Draw a circle around ten Xs. Write the total number of Xs. X X X X X X X X _____ X X X X X X Notice how the student counts, circles, and writes the number. Does the student correctly circle a group of ten Xs? Does the student write the correct number? Does the student find the total by (1) counting by ones, (2) counting on from ten (10, 11, 12,), (3) counting the four "extras" and writing 14, or (4) writing 14 by visualizing 10 and 4 (no counting)? Sue has 16 teddy bears. Draw a picture to represent the number 16. Circle the group of 10. Write an equation representing your picture. Randy has 13 cars. Show the number of cars Randy has using the base ten blocks.	(DOK 2)
	Domains – Counting and Cardinality & Numbers & Operations Base Ten	**Curriculum Supports**	**Vocabulary**
K.CC.2 **K.CC.3** **K.CC4b** **K.NBT.1**	**Know number names and the count sequence.** 2. Count forward from a given number within the known sequence instead of having to begin at 1. **Know number names and the count sequence.** 3. Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects). **Count to tell the number of objects.** 4. Understand the relationship between numbers and quantities; connect counting to cardinality. 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. **Work with numbers 11–19 to gain foundations for place value.** 1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition	**enVision 2012** **Topic 5: Numbers to 20** **5-1** Counting, Reading and Writing 11 and 12 **5-2** Counting, Reading and Writing 13, 14 and 15 **5-3** Counting, Reading and Writing 16 and 17 **5-4** Counting Reading, and Writing 18, 19, and 20 **5-5** Problem Solving: Use Logical Reasoning Lessons 5-1 Counting, Reading, and Writing 11 and 12 ..... 93A 5-2 Counting, Reading, and Writing 13, 14, and 15 ..... 95A 5-3 Counting, Reading, and Writing 16 and 17 ..... 97A 5-4 Counting, Reading, and Writing 18, 19, and 20 ..... 99A 5-5 Problem Solving Use Logical Reasoning 101A	**K.CC.2** count, number names from 1-100, counting on, order, ones, before, after, in all, how many **K.CC.3** set, numeral, number, number names zero to twenty, quantity, order **K.CC4** numeral, number,

	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.		number names, “how many,” count, “one more,” quantity, set, object **K.NBT.1** place value, tens, ones, digits, number, decompose, compose, equation, equal, plus, number words 1-19, grouping
	Additional Assessment Options	• **Topic 5: Numbers to 20** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 5 Numbers to 20** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 2: November 2-January 15 **Flexible Pacing: 41 days**

Domain: Counting and Cardinality
Numbers to 100

Report Card Learning Targets **I can….** • Count to 100 by ones and tens • Count to tell the number of objects		
Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.CC.1	Count by ones in sequential order from 1 to 100. Count by tens in order to 100. (DOK 1)	Beginning with one, count as far as you can count. Count to 100 by tens. (DOK 1)
K.CC.2	Have the student orally count from a given number (e.g., "Start at 10 and count until I tell you to stop"). Count up to 45. (DOK 1)	Susan has 11 books. On her birthday she got 5 more. Count on to determine how many books Susan has all together. Use objects or pictures to show how many Susan has in all. Draw a picture to show how many Susan has in all. (DOK 2)
K.CC.4b	Place a set of objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 30. Then add one more and tell you how many. (DOK 1)	Give student a set of 21 cubes to count. Say: *Count to see how many you have*. Add 1 more cube to the set. Ask: *How many do I have now?* Add I more. Ask: *How many now?* Continue until there are 30 cubes. (DOK 1)
K.CC.4c	Place a set of 10 (Total of 30) objects in front of the student. Ask them to count and tell you how many. Have the student make a group of 10. Then add one more set of 10, ask the student to count them and tell you how many? Add one more set of 10, have the student count them and ask how many? Now count each group by tens. Ten, twenty, thirty).	Give student a set of 50 cubes to count. Say: *Count to see how many groups of 10 you can make?* Ask: *Count by tens to find out how many cubes in all? How many groups of 10 did you make?* (DOK 2)

	(DOK 2)		
K.CC.5	Teacher provides students with concrete and/or pictorial objects arranged in a line, rectangular array or circle from 11-20 in a given set. Student will count "how many". (DOK 2)	Show the student a number 11- 20. Say: *Look at the number and count out* (or draw or use stickers or stamps) *to show the number you see.* (DOK 1)	
	Domain: Counting and Cardinality	**Curriculum Supports**	**Vocabulary**
K.CC.1 **K.CC.2** **K.CC.4**	**Know number names and the count sequence.** 1. Count to 100 by ones and by tens. **Know number names and the count sequence.** 2. Count forward from a given number within the known sequence instead of having to begin at 1. **Count to tell the number of objects.** 4. Understand the relationship between numbers and quantities; connect counting to cardinality. 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. **Count to tell the number of objects.** 5. Count to answer "how many?" questions about as many	**enVision 2012** **Topic 6: Numbers to 100** **6-1** Counting to 30 **6-2** About How Many? **6-3** Counting to 100 **6-4** Counting Groups of 10 **6-5** Patterns on a Hundred Chart **6-6** Problem Solving: Look for a Pattern **Lessons** 6-1 Counting to 30 ....109A 6-2 About How Many? ....111A 6-3 Counting to 100 ....113A 6-4 Counting Groups of Ten ....115A 6-5 Patterns on a Hundred Chart ....117A 6-6 Problem Solving Look for a Pattern 119A	**K.CC.1** count, ones, tens, order, number names from one to 100 **K.CC.2** count, number names from 1-100, counting on, order, ones, before, after, in all, how many **K.CC4** numeral, number, number names, "how many," count, "one more,"

K.CC.5	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 1-20, count out that many objects.		quantity, set, object **K.CC.5** count, set, objects, array, number line, scattered, how many, order
	Additional Assessment Options	• **Topic 6 Test- Numbers to 100** enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 6 Numbers to 100** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 2: November 2-January 15 **Flexible Pacing: 41 days**

Domain: Operations and Algebraic Thinking
Understanding Addition

Report Card Learning Targets
I can….

- Understand addition with objects, drawings, and equations
- Solve addition and subtraction word problems using objects and drawings
- Fluently add within 5

Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.OA.1	Teacher distributes linking cubes to students. Teacher reads an addition story problem and has students act out the problem using the linking cubes. (DOK 1)	Students create their own addition or subtraction story problem using objects, fingers, mental images, drawings, sounds, acting out situations, or verbal explanations. (DOK 2)
K.OA.2	Teacher dictates an addition story problem. For example: Olivia has 3 lollipops and her friend Sophie 2 lollipops. How many lollipops do they have all together? Students draw a picture to solve the problem. (DOK 2)	Teacher creates number cards 1 -5. Students will draw two number cards from the pile. Students will create an addition/subtraction problem and solve using illustrations and equation. (DOK 2)
K.OA.5	Ask the students to solve addition and subtraction problems within ten mentally. Then have them tell you the strategy they used. This can be done on an individual basis or as a whole group. (DOK 2)	Give the student a problem in context, such as the problem below, and ask him/her to solve it using mental strategies. Then have him/her tell you the strategies he/she used. Peter has 4 puppies and Marina has 2 puppies. How many puppies do they have together? (DOK 2)

	Domain – Operations and Algebraic Thinking	Curriculum Supports	Vocabulary
	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	**enVision 2012**	**K.OA.1**
K.OA.1	1. Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.	**Topic 7: Understanding Addition** **7-1** Stories About Joining **7-2** More Joining **7-3** Joining Groups **7-4** Using the Plus Sign **7-5** Finding Sums **7-6** Addition Sentences **7-7** Problem Solving: Draw a Picture	join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart
K.OA.2	2. Solve addition and subtraction word problems, and add and subtract within 10 (e.g., by using objects or drawings to represent the problem).	 Lessons 7-1 Stories About Joining ..... 127A 7-2 More Joining ..... 129A 7-3 Joining Groups ..... 131A 7-4 Using the Plus Sign ..... 133A 7-5 Finding Sums ..... 135A 7-6 Addition Sentences ..... 137A 7-7 Problem Solving Draw a Picture 139A	**K.OA.2** join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart
K.OA.5	5. Fluently add and subtract within 5.		**K.OA.5** add, subtract, equation, sum, difference, equal sign, plus, minus
	Additional Optional Assessments	• **Topic 7: Understanding Addition** (enVision 2012) from your CFA account will match the concepts you have taught.	

CFA 2: November 2-January 15 **Flexible Pacing: 41 days**

Domain: Operations and Algebraic Thinking
Understanding Subtraction

Report Card Learning Targets
I can….

- Understand addition with objects, drawings, and equations
- Understand subtraction with objects, drawings, and equations
- Solve addition and subtraction word problems using objects and drawings
- Fluently add within 5
- Fluently subtract within 5

Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.OA.1	Provide materials to the student. Read the problem to the student: There were 5 children playing at the beach. 3 of them were boys. How many children are girls? Show your thinking with objects, words, pictures or numbers. (DOK 2)	Provide materials to the student. Read the problem to the student: Destiny had 5 balloons. 3 balloons floated away. How many balloons does Destiny have now? Show your thinking with objects, words, pictures or numbers. (DOK 2)
K.OA.2	5 motorcycles are in the parking lot. Three are black and the rest are red. How many motorcycles are red? Show your thinking with the red and black cubes. *(DOK 2)*	Teacher creates number cards 1 -5. Students will draw two number cards from the pile. Students will create an addition/subtraction problem and solve using illustrations. (DOK 2)
K.OA.5	Ask the students to solve subtraction problems within five mentally. Then have them tell you the strategy they used. This can be done on an individual basis or as a whole group. (DOK 2)	Say: I'm going to tell you some problems. See if you can solve each one as quickly as you can. Ready? 1. There are 4 marbles in the jar. I took out 2 marbles. How many marbles are in the jar? 2. There are 4 jellybeans in the jar. I ate 3 jellybeans. How many jellybeans are in the jar? 3. There are 3 shells in the basket and I took 1 shell out of the basket. How many shells are in the basket? 4. There are 5 cookies. I ate 4 cookies. How many cookies are

		there? *Show your thinking with objects, words, pictures or numbers.* (DOK 2)	
	Domain – Operations and Algebraic Thinking	**Curriculum Supports**	**Vocabulary**
K.OA.1 **K.OA.2** **K.OA.5**	**Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.** 1. Represent addition and subtraction with objects, fingers, mental images, drawings*, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. 2. Solve addition and subtraction word problems, and add and subtract within 10 (e.g., by using objects or drawings to represent the problem). 5. Fluently add and subtract within 5.	**enVision 2012** **Topic 8: Understanding Subtraction** **8-1** Stories About Separating **8-2** Stories About Take Away **8-3** Stories About Comparing **8-4** Problem Solving: Act it Out **8-4** Using the Minus Sign **8-5** Finding Differences **8-6** Subtraction Sentences **8-8** Problem Solving: Use Objects **Lessons** 8-1 Stories About Separating ..... 147A 8-2 Stories About Take Away ..... 149A 8-3 Stories About Comparing ..... 151A 8-4 Problem Solving Act It Out ..... 153A 8-5 Using the Minus Sign ..... 155A 8-6 Finding Differences ..... 157A 8-7 Subtraction Sentences ..... 159A 8-8 Problem Solving Use Objects 161A	**K.OA.1** join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart **K.OA.2** join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart **K.OA.5** add, subtract, equation, sum, difference, equal sign, plus, minus
	Additional Optional Assessments	• **Topic 8: Understanding Subtraction** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 8 Understanding Subtraction** (enVision)	

CFA 3: January 19-April 1 **Flexible Pacing: 49 days**

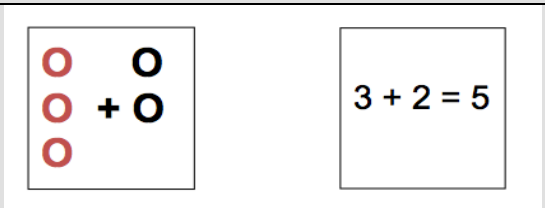
Domain: Operations and Algebraic Thinking

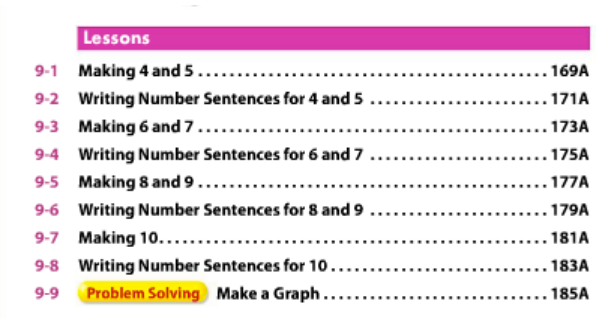
Composing and Decomposing Numbers to 10

Report Card Learning Targets

I can….

- Understand addition with objects, drawings, and equations
- Understand subtraction with objects, drawings, and equations
- Combine two numbers to make 10
- Classify, count, and sort objects into categories

Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.OA.3	 Students will be given a story such as the following: John has 3 cookies. Mary gives John 2 more cookies. How many cookies in all does John have? Students will record their thinking with drawings or equation. (DOK 2)	Students will be given seven two-sided counters and will be asked to show a minimum of three combinations of seven. Students will record their results with a drawing or equation. (DOK 2)
K.OA.4	Students have ten beans, with the sides of the beans colored different colors. Students will shake and spill the beans. They will count how many beans they have of one color and record their answers on using a worksheet with ten circles. Then they will count how many beans they have of another color and then record their answers on the worksheet. Examples for assessment: 1. Students draw the number of colored circles they have using an equation. For example: ***** + ***** = ********** 2. Students write the equation using numerals. 5 + 5 = 10 (DOK 2)	Students choose a number from 0-9 and then, using a ten frame, draw circles or write how many more they need to get to 10. Repeat the activity for a total of four work samples. (DOK 2)
K.MD.3	Given objects, students will sort them by an attribute and name the attribute.	Divide students to small groups, and have them remove their shoes. Have each group pick a common attribute and sort the shoes

	Given groups or objects sorted by an attribute, students can count each group and identify the group with the most/least of the attribute. (DOK 2)	accordingly (laces/no laces, color, type, etc.). Have students explain their attributes and identify how many shoes are in each group. Students should identify the groups with the most and least shoes. (DOK 3)	
	Domain – Operations and Algebraic Thinking	**Curriculum Supports**	**Vocabulary**
	Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.	**enVision 2012**	**K.OA.3**
K.OA.3	3. Decompose 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).	**Topic 9: Composing and Decomposing Numbers to 10** **9-1** Making 4 and 5 **9-2** Writing Number Sentences for 4 and 5 **9-3** Making 6 and 7 **9-4** Writing Number Sentences for 6 and 7 **9-5** Making 8 and 9 **9-6** Writing Number Sentences for 8 & 9 **9-7** Making 10 **9-8** Writing Number Sentences for 10 **9-9** Problem Solving: Make a Graph	join, add, addend, addition, equal to, equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart
K.OA.4	4. For any number from 1 to 9, find the number that makes 10 when added to the given number (e.g., by using objects or drawings), and record the answer with a drawing or equation.	 Lessons 9-1 Making 4 and 5 ..... 169A 9-2 Writing Number Sentences for 4 and 5 ..... 171A 9-3 Making 6 and 7 ..... 173A 9-4 Writing Number Sentences for 6 and 7 ..... 175A 9-5 Making 8 and 9 ..... 177A 9-6 Writing Number Sentences for 8 and 9 ..... 179A 9-7 Making 10 ..... 181A 9-8 Writing Number Sentences for 10 ..... 183A 9-9 Problem Solving Make a Graph 185A	**K.OA.4** in, add, addend, addition, equal to,
K.MD.3	**Classify objects and count the number of objects in each category.** 3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by number.		

			equation, expression, subtract, sum, difference, plus, minus, separate, combine, put together, total, take away, compare, take apart **K.MD.3** classify, sort, attribute, groups, categories, count
	Additional Assessment Options	• **Topic 9: Composing and Decomposing Numbers to 10**(enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 9 Composing and Decomposing Numbers to 10** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 3: January 19-April 1 **Flexible Pacing: 49 days**

Domain: Numbers and Operations in Base Ten

Composing Numbers 11 to 19

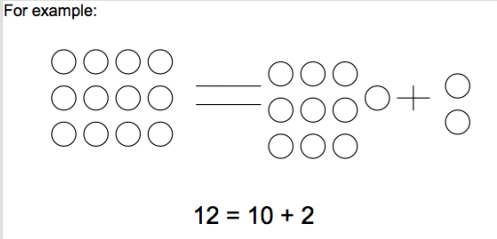
Report Card Learning Targets **I can….** • Make or break apart numbers from 11-19 into tens and ones		
Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.NBT.1	Students will count 11 – 19. Student draws a number card. For example student draws the number 14. Student first represents fourteen with cubes. 10 cubes of one color snapped together and 4 cubes of another color snapped together. Then the student will write an equation. 14 = 10 + 4 10 + 4 = 14 (DOK 2)	Present student with 14 counters and the ten frame. Say: I have some counters. How many do you think there might be? Do you think they will fit on the ten frame? Use the ten frame to find out how many counters there are. After the student has finished, ask: What did you find out? How do you know? Prompt, if needed: Did you have enough to fill the ten frame? How many did not fit on the ten frame? How many counters are there in all? Then, ask the student to write the total amount. Repeat with 16 counters. (DOK 3)

	Domain: Numbers & Operations in Base Ten	Curriculum Supports	Vocabulary
K.NBT.1	**Work with numbers 11–19 to gain foundations for place value.** 1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects 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.	**enVision 2012** **Topic 10: Composing Numbers 11 to 19** **10-1** Making 11,12 and 13 **10-2** Making 14, 15, and 16 **10-3** Making 17, 18, 19 **10-4** Problem Solving**:** Looking for a Pattern  Lessons 10-1 Making 11, 12, and 13 ..... 193A 10-2 Making 14, 15, and 16 ..... 195A 10-3 Making 17, 18, and 19 ..... 197A 10-4 Problem Solving Look for a Pattern 199A	**K.NBT.1** place value, tens, ones, digits, number, decompose, compose, equation, equal, plus, number words 1-19, grouping
	Additional Optional Assessments	• **Topic 10: Composing Numbers 11 to 19**(e 2012) from your CFA account will match t concepts you have taught. • **Performance Assessment- Topic 10 Composing Numbers 11 to 19** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 3: January 19-April 1 **Flexible Pacing: 49 days**

Domain: Numbers and Operations in Base Ten

Decomposing Numbers 11 to 19

Report Card Learning Targets **I can….** • Make or break apart numbers from 11-19 into tens and ones			
Assessment Tasks			
	Skill-Based Check	**Performance Task**	
K.NBT.1	Students will correctly model the numbers 11-19 using objects and pictorial representations. Students will write an equation for a given number from 11-19.  (DOK 2)	Present student with 15 counters and the ten frame. Say: I have some counters. How many do you think there might be? Do you think they will fit on the ten frame? Use the ten frame to find out how many counters there are. After the student has finished, ask: What did you find out? How do you know? Prompt, if needed: Did you have enough to fill the ten frame? How many did not fit on the ten frame? How many counters are there in all? Then, ask the student to write the total amount. Repeat with 17 counters. (DOK 3)	
	Domain: Numbers & Operations in Base Ten	**Curriculum Supports**	**Vocabulary**
K.NBT.1	**Work with numbers 11–19 to gain foundations for place value.** 1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects 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.	**enVision 2012** **Topic 11: Decomposing Numbers 11 to 19** **11-2** Creating Sets to 19 **11-2** Parts of 11, 12, and 13 **11-3** Parts of 14, 15, and 16 **11-4** Parts of 17, 18, and 19 **11-5** Problem Solving: Look for a Pattern	**K.NBT.1** place value, tens, ones, digits, number, decompose, compose, equation, equal, plus, number words 1-19, grouping

		Lessons 11-1 Creating Sets to 19 ..... 207A 11-2 Parts of 11, 12, and 13 ..... 209A 11-3 Parts of 14, 15, and 16 ..... 211A 11-4 Parts of 17, 18, and 19 ..... 213A 11-5 Problem Solving Look for a Pattern 215A	
	Additional Optional Assessments	• **Topic 11: Decomposing Numbers 11 to 19**(enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 11 Decomposing Numbers 11 to 19** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 3: January 19-April 1 **Flexible Pacing: 49 days**

Domain: Measurement and Data

Measurement

Report Card Learning Targets **I can….** • Describe and compare characteristics of objects			
Assessment Tasks			
	Skill Based Check	**Performance Task**	
K.MD.1	When given an object, the student can show/tell the teacher at least two ways of measuring the object. (DOK 2)	Students can pick an object in the classroom and describe the measurable attributes of the object. (DOK 2)	
K.MD.2	Shown 2 objects, students will be able to identify the tallest/shortest. Shown 2 groups of objects, students will be able to identify which group has more and which group has fewer objects. Students can build an object that is either taller/shorter or more/less than a given object/model. (DOK 2)	Show the student the Teddy Bear (or a stuffed animal). Invite the student to hold it and carefully examine it. Then, say: Describe this Teddy Bear as many different ways as you can. Prompt if needed: How would you describe the Teddy Bear's weight? The Teddy Bear's length? The distance around the Teddy Bear's belly? The Teddy Bear's foot length? (DOK 2)	
	Domain – Measurement & Data	**Curriculum Supports**	**Vocabulary**
K.MD.1 **K.MD.2**	**Describe and compare measurable attributes.** 1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. 2. Directly compare two objects with a measurable attribute in common, to see which object 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.)	**enVision 2012** **Topic 12: Measurement** **12-1** Describing Objects by More Than One Attribute **12-2** Comparing by Length **12-3** More Comparing Objects by Length **12-4** Problem Solving: Try, Check, and Revise **12-5** Comparing Objects by Height **12-6** More Comparing Objects by Height	**K.MD.1** length, width, capacity, weight, measuring, size, attribute, measurable **K.MD.2** more of, less of, taller/shorter, heavier/lighter, compare, attributes, measuring, height

		12-7 Comparing Capacities **12-8** Comparing Weight  Lessons 12-1 Describing Objects by More Than One Attribute .....223A 12-2 Comparing by Length .....225A 12-3 More Comparing Objects by Length.....227A 12-4 Problem Solving Try, Check, and Revise .....229A 12-5 Comparing by Height .....231A 12-6 More Comparing Objects by Height .....233A 12-7 Comparing Capacities.....235A 12-8 Comparing by Weight 237A	
	Additional Optional Assessments	• **Topic 12: Measurement** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 12 Measurement**(enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 3: January 19-April 1 **Flexible Pacing: 49 days**

Domain: Measurement and Data & Geometry

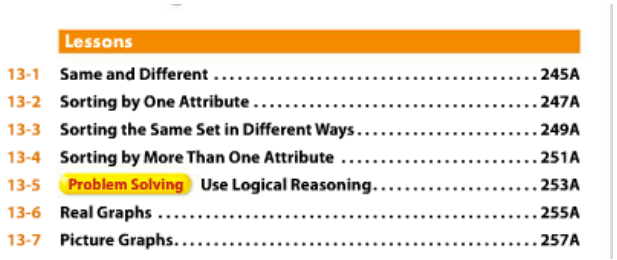
Sorting, Classifying, Counting, and Categorizing Data

Report Card Learning Targets
I can….

- Classify, count, and sort objects into categories
- Name shapes and identify its position

Assessment Tasks		
	Skill-Based Check	**Performance Task**
K.MD.3	Given objects, students will sort them by an attribute and name the attribute. Given groups or objects sorted by an attribute, students can count each group and identify the group with the most/least of the attribute. (DOK 2)	Show the student the collection of cubes. Say: I have a set of cubes. Sort these cubes by color. After the student has sorted the cubes by color, say: Count the number of cubes in each group. How many cubes do you have in each group? Do you have any groups that have the same amount?" Prompt if needed: "Which groups have the same amount?" (DOK 2)
K.G.1	Teacher gives a student a box and a puppet. Student demonstrates a positional word using the box and puppet. Teacher gives a student an object, and students identify the shape of the object. (DOK 1)	Students are given a sheet of paper with a table drawn on it. Teacher gives directions to draw balls in different colors using positional words (for example, "Draw a yellow ball under the table"; "Draw a blue ball next to the table"). (DOK 2)

	Domains: Measurement & Data & Geometry	**Curriculum Supports**	**Vocabulary**
K.MD.3	**Classify objects and count the number of objects in each category.** **3.** Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. **Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).** 1. Describe objects in the environment using names of	**enVision 2012** **Topic 13: Sorting, Classifying, Counting, and Categorizing Data** **13-1** Same and Different **13-2** Sorting by one Attribute **13-3** Sorting the Same Set in Different Ways **13-4** Sorting by More than One Attribute **13-5** Problem Solving: Use Logical Reasoning	**K.MD.3** classify, sort, attribute, groups, categories, count **K.G.1** above,

K.G.1	shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind,* and *next to.*	**13-6** Real Graphs **13-7** Picture Graphs  Lessons 13-1 Same and Different ..... 245A 13-2 Sorting by One Attribute ..... 247A 13-3 Sorting the Same Set in Different Ways ..... 249A 13-4 Sorting by More Than One Attribute ..... 251A 13-5 Problem Solving Use Logical Reasoning ..... 253A 13-6 Real Graphs ..... 255A 13-7 Picture Graphs 257A	below, under, on top, around, near, beside, in front of, behind, between, next to, square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere
	Additional Optional Assessments	• **Topic 13 Test: Sorting, Classifying, Counting, and Categorizing Data**(enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 13 Sorting Classifying, Counting, and Categorizing Data** (enVision 2012) Found at the end of each in the Common Core edition and would be administered paper-pencil.	

CFA 4: April 11-June 3 **Flexible Pacing: 37 days**

Domain: Geometry

Identifying and Describing Shapes

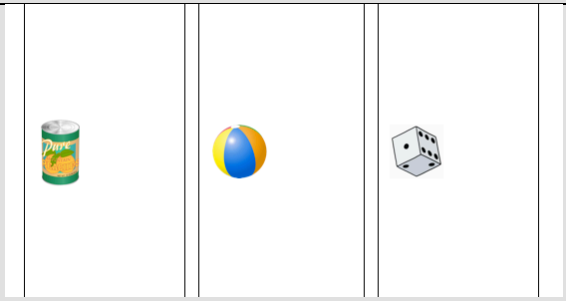
Report Card Learning Targets **I can….** • Name shapes and identify its position • Identify and compare 2D and 3D shapes		
Assessment Tasks		
	Skill Based Check	**Performance Task**
K.G.2	Show the students a set of shapes with different sizes and orientations. Ask them to name them. Ask the students to describe the attributes of specified shapes and solids. "Describe a cone. Tell me the attributes of a triangle." (DOK 2)	Joey has a shape with 4 corners and 4 equal sides. What shape does he have? Explain your answer with a picture, with objects or in writing. Esperanza wants to wrap her teddy bear. Which shapes of wrapping paper could she use? Explain what shape you chose and why. (DOK 3)
K.G.3	Given a shape, students can identify the shape as either flat or solid. (DOK 1)	Given a group of shapes, students can identify the flat and solid shapes. (DOK 2)

	Domain – Geometry	**Curriculum Supports**	**Vocabulary**
K.G.2 **K.G.3**	**Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).** 2. Correctly name shapes regardless of their orientations or overall size. 3. Identify shapes as two-dimensional (lying in a plane, "flat") or three-dimensional ("solid").	**enVision 2012** **Topic 14: Identifying and Describing Shapes** **14-1** Rectangles **14-2** Squares **14-3** Circles **14-4** Triangles **14-5** Hexagons **14-6** Solid Figures **14-7** Flat Surfaces of Solid Figures **14-8** Problem Solving: Use Objects	**K.G.2** flip, rotate, turn, triangle, square, circle, rectangle, hexagon, cone, cylinder, cube,

		Lessons 14-1 Rectangles ....265A 14-2 Squares ....267A 14-3 Circles ....269A 14-4 Triangles ....271A 14-5 Hexagons ....273A 14-6 Solid Figures ....275A 14-7 Flat Surfaces of Solid Figures ....277A 14-8 Problem Solving Use Objects 279A	sphere, attribute, large, small, medium, describe, facet (the flat side of a three-dimensional shape), vertices (where facets join) **K.G.3** flat, solid, two-dimensional, three-dimensional, squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, spheres
	Additional Assessment Options	• **Topic 14: Identifying and Describing Shapes** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Topic 14 Identifying and Describing Shapes** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

CFA 4: April 11-June 3 **Flexible Pacing: 37 days**

Domain: Geometry
Position and Location of Shapes

Report Card Learning Targets **I can….** • Name shapes and identify its position		
Assessment Tasks		
	Skill Based Task	**Performance Task**
K.G. 1	 Students will place a sticker ***BELOW*** the cylinder, **ABOVE** the sphere, and **BESIDE** the cube. (DOK 1)	1. Show each shape one at a time to the student. Ask the student to name the shape. (circle, square, rectangle, hexagon, cone, sphere) 2. Spread the shapes out on a table. Place the empty bag on the table. Say, *I have a bag and some shapes. I am going to give you some directions about where to place the different shapes around the bag.* a. Put the cone **above** the bag. b. Put the square **beside** the bag. c. Put the circle **inside** the bag. d. Put the rectangle **behind** the bag. e. Put the hexagon **in front** of the bag. f. Put the sphere **below** the bag. (DOK 2)

	Domain: Geometry	**Curriculum Supports**	**Vocabulary**
K.G.1	**Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).** 1.Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above, below, beside, in front of, behind,* and *next to.*	**enVision 2012** **Topic 15: Position and Location of Shapes** **15-1** Inside and Outside **15-2** Above, Below, and On **15-3** In Front of and Behind **15-4** Left and Right **15-5** Problem Solving: Act It Out	**K.G.1** above, below, under, on top, around, near, beside, in front of, behind,

		Lessons 15-1 Inside and Outside ..... 287A 15-2 Above, Below, and On ..... 289A 15-3 In Front Of and Behind ..... 291A 15-4 Left and Right ..... 293A 15-5 Problem Solving Act It Out 295A	between, next to, square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere
	Additional Assessment Options	• **Topic 15 Test- Position and Location of Shapes (**enVision 2012) from your CFA account will match the concepts you have taught • **Performance Assessment- Position and Location of Shapes** (enVision 2012) Found at the end of each topic in the Common Core edition and would be administered paper-pencil.	

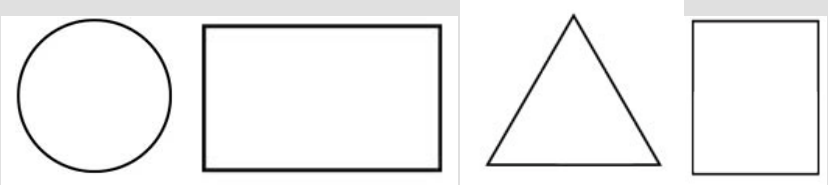
CFA 4: April 11-June 3 **Flexible Pacing: 37 days**

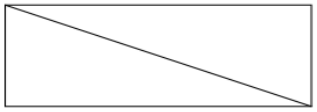
Domain: Geometry

Analyzing, Composing, and Comparing Shapes

Report Card Learning Targets
I can….

- Name shapes and identify its position
- Identify and compare 2-D and 3-D shapes
- Build and draw shapes

	Assessment Tasks	
	Skill-Based Check	**Performance Task**
K.G.2	Show the students a set of shapes with different sizes and orientations. Ask them to name them. Ask the students to describe the attributes of specified shapes and solids. "Describe a sphere. Tell me the attributes of a rectangles." (DOK 2)	 Color the two shapes that are almost the same. Explain how you chose. (DOK 2) Which shape is the most different from the others? Explain how you chose. (DOK 2)
K.G.3	1. Show a collection of shapes and solids. These can be models from your math manipulative kits or actual items from around the classroom. 2. Ask students to sort the objects into the categories "Shapes" or "Solids". (DOK 2)	Show the student a collection of shapes and solids (square, circle, triangle, rectangle, hexagon, cube, cone, and cylinder). Say: *Put all of the shapes together in a pile and all of the solids together in a different pile*. Pull out the student a triangle and a rectangle. Remove the other shapes. Ask: *How are these shapes alike? How are they different?* Repeat with a circle and a cylinder; cube and a square. (DOK 2)

K.G.4	When presented with a variety of shapes, students can find common/different attributes, including dimensions. When given two shapes, students can identify the similarities and differences of the two shapes. Students can count the number of corners, sides, etc., on a shape. (DOK 2)	Given a piece of paper with different shapes drawn on it, students can circle or color all examples of the same shape, regardless of size or orientation. When given a list of attributes describing a shape, students can point to the correct shape, and name the shape. (DOK 2)
K.G.5	Teacher dictates a specific shape, and students draw the shape and its attributes correctly. (DOK 1)	1. Show the student a triangle. Ask: *What is the name of this shape? How do you know that this is a triangle?* Then, ask the student to draw the shape. Repeat with a rectangle and a square. 2. Show the student the cube. Ask: *What is the name of this solid? How do you know that this is a cube?* Then, ask the student to build a cube using materials provided. Repeat with a sphere and cylinder. (DOK 3)
K.G.6	Students will show how to compose simple shapes to form different and or larger shapes. Can you show me a rectangle using square pattern blocks? Using square pattern blocks (4), show me how to make a larger square. Show me how to combine these two triangles to make a rectangle.  (DOK 2)	Students are given a variety of materials (e.g., attribute blocks, pipe cleaners, Popsicle sticks, shape cutouts) to use in composing the following shapes: square, rectangle, and triangle. (DOK 2)

	Domain: Geometry	Curriculum Supports	Vocabulary
K.G	**Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).** 2. Correctly name shapes regardless of their orientations or overall size.	**enVision 2012** **Topic 16: Analyzing, Comparing, and Composing Shapes** **16-1** Same Size, Same Shape **16-2** Making Shapes from Other Shapes **16-3** Comparing Solid Figures	**K.G.2** flip, rotate, turn, triangle, square, circle, rectangle, hexagon, cone, cylinder, cube, sphere, attribute, large, small,

	3. Identify shapes as two-dimensional (lying in a plane, “flat”) or three-dimensional (“solid”). 4. Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/“corners”) and other attributes (e.g., having sides of equal length). 5. Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes. 6. Compose simple shapes to form larger shapes. (For example, “Can you join these two triangles with full sides touching to make a rectangle?”)	**16-4** Building with Solid Figures **16-5** Problem Solving: Use Logical Reasoning Lessons 16-1 Same Size, Same Shape ..... 303A 16-2 Making Shapes from Other Shapes..... 305A 16-3 Comparing Solid Figures ..... 307A 16-4 Building with Solid Figures ..... 309A 16-5 Problem Solving Use Logical Reasoning 311A	medium, describe, facet (the flat side of a three-dimensional shape), vertices (where facets join) **K.G.3** classify, sort, attribute, groups, categories, count **K.G.4** compare, similarities, differences, size, orientation, attribute, part, side, point/corner/vertex, straight, round, curved, shape, square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere K.G.5 square, circle, triangle, rectangle, hexagon, cube, cone, cylinder, sphere, two-dimensional, three-dimensional, flat, solid , sides, same, alike, different K.G.6 create, compose, explore, combine, different, larger, simple , shape

	Additional Optional Assessments	**Topic 16 Test- Analyzing,** • **Comparing, and Composing Shapes** (enVision 2012) from your CFA account will match the concepts you have taught. • **Performance Assessment- Adding and Subtracting Fractions and Mixed Numbers with Like Denominators** enVision 2012) from your CFA account will match the concepts you have taught	

North Carolina Department of Public Instruction
INSTRUCTIONAL SUPPORT TOOLS
FOR ACHIEVING NEW STANDARDS

K Grade Mathematics ● Unpacked Content

For the new Common Core standards that will be effective in all North Carolina schools in the 2012-13.

This document is designed to help North Carolina educators teach the Common Core (Standard Course of Study). NCDPI staff are continually updating and improving these tools to better serve teachers.

What is the purpose of this document?
To increase student achievement by ensuring educators understand specifically what the new standards mean a student must know, understand and be able to do. This document may also be used to facilitate discussion among teachers and curriculum staff and to encourage coherence in the sequence, pacing, and units of study for grade-level curricula. This document, along with on-going professional development, is one of many resources used to understand and teach the CCSS.

What is in the document?
Descriptions of what each standard means a student will know, understand and be able to do. The "unpacking" of the standards done in this document is an effort to answer a simple question "What does this standard mean that a student must know and be able to do?" and to ensure the description is helpful, specific and comprehensive for educators.

How do I send Feedback?
We intend the explanations and examples in this document to be helpful and specific. That said, we believe that as this document is used, teachers and educators will find ways in which the unpacking can be improved and made ever more useful. Please send feedback to us at feedback@dpi.state.nc.us and we will use your input to refine our unpacking of the standards. Thank You!

Just want the standards alone?
You can find the standards alone at http://corestandards.org/the-standards

At A Glance

This page provides a snapshot of the mathematical concepts that are new or have been removed from this grade level as well as instructional considerations for the first year of implementation.

New to Kindergarten:

- Fluently add and subtract within 5 (K.CC.5)
- Compose and decompose numbers from 11 to 19 into ten ones and some further ones (K.NBT.1)
- Identify and describe shapes (NEW: squares, hexagons, cones, cylinders) (K.G)
- Identify shapes as two-dimensional or three-dimensional (K.G.3)
- Compose simple shapes to form larger shapes (K.G.6)

Moved from Kindergarten:

- Ordinals (1.01e)
- Equal Shares (1.02)
- Calendar Concepts & Time (2.02)
- Data Collection (4.01, 4.02)
- Repeating Patterns (5.02)

Notes:

- Topics may appear to be similar between the CCSS and the 2003 NCSCOS; however, the CCSS may be presented at a higher cognitive demand.
- For more detailed information see Math Crosswalks: http://www.dpi.state.nc.us/acre/standards/support-tools/

Standards for Mathematical Practice in Kindergarten

The Common Core State Standards for Mathematical Practice are expected to be integrated into every mathematics lesson for all students Grades K-12. Below are a few examples of how these Practices may be integrated into tasks that students complete.

Practice	Explanation and Example
1. **Make Sense and Persevere in Solving Problems.**	Mathematically proficient students in Kindergarten begin to develop effective dispositions toward problem solving. In rich settings in which informal and formal possibilities for solving problems are numerous, young children develop the ability to focus attention, test hypotheses, take reasonable risks, remain flexible, try alternatives, exhibit self-regulation, and persevere (Copley, 2010). Using both verbal and nonverbal means, kindergarten students begin to explain to themselves and others the meaning of a problem, look for ways to solve it, and determine if their thinking makes sense or if another strategy is needed. As the teacher uses thoughtful questioning and provides opportunities for students to share thinking, kindergarten students begin to reason as they become more conscious of what they know and how they solve problems.
2. **Reason abstractly and quantitatively.**	Mathematically proficient students in Kindergarten begin to use numerals to represent specific amount (quantity). For example, a student may write the numeral "11" to represent an amount of objects counted, select the correct number card "17" to follow "16" on the calendar, or build a pile of counters depending on the number drawn. In addition, kindergarten students begin to draw pictures, manipulate objects, use diagrams or charts, etc. to express quantitative ideas such as a joining situation (Mary has 3 bears. Juanita gave her 1 more bear. How many bears does Mary have altogether?), or a separating situation (Mary had 5 bears. She gave some to Juanita. Now she has 3 bears. How many bears did Mary give Juanita?). Using the language developed through numerous joining and separating scenarios, kindergarten students begin to understand how symbols (+, -, =) are used to represent quantitative ideas in a written format.
3. **Construct viable arguments and critique the reasoning of others.**	In Kindergarten, mathematically proficient students begin to clearly express, explain, organize and consolidate their math thinking using both verbal and written representations. Through opportunities that encourage exploration, discovery, and discussion, kindergarten students begin to learn how to express opinions, become skillful at listening to others, describe their reasoning and respond to others' thinking and reasoning. They begin to develop the ability to reason and analyze situations as they consider questions such as, "Are you sure…?" , "Do you think that would happen all the time…?", and "I wonder why…?"
4. **Model with mathematics.**	Mathematically proficient students in Kindergarten begin to experiment with representing real-life problem situations in multiple ways such as with numbers, words (mathematical language), drawings, objects, acting out, charts, lists, and number sentences. For example, when making toothpick designs to represent the various combinations of the number "5", the student writes the numerals for the various parts (such as "4" and "1") or selects a number sentence that represents that particular situation (such as 5 = 4 + 1)*. *According to CCSS, "Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten in encouraged, but it is not required". However, please note that it is not until First Grade when "Understand the meaning of the equal sign" is an expectation (1.OA.7).

5. Use appropriate tools strategically.	In Kindergarten, mathematically proficient students begin to explore various tools and use them to investigate mathematical concepts. Through multiple opportunities to examine materials, they experiment and use both concrete materials (e.g. 3-dimensional solids, connecting cubes, ten frames, number balances) and technological materials (e.g., virtual manipulatives, calculators, interactive websites) to explore mathematical concepts. Based on these experiences, they become able to decide which tools may be helpful to use depending on the problem or task. For example, when solving the problem, "There are 4 dogs in the park. 3 more dogs show up in the park. How many dogs are in the park?", students may decide to act it out using counters and a story mat; draw a picture; or use a handful of cubes.
6. **Attend to precision**	Mathematically proficient students in Kindergarten begin to express their ideas and reasoning using words. As their mathematical vocabulary increases due to exposure, modeling, and practice, kindergarteners become more precise in their communication, calculations, and measurements. In all types of mathematical tasks, students begin to describe their actions and strategies more clearly, understand and use grade-level appropriate vocabulary accurately, and begin to give precise explanations and reasoning regarding their process of finding solutions. For example, a student may use color words (such as blue, green, light blue) and descriptive words (such as small, big, rough, smooth) to accurately describe how a collection of buttons is sorted.
7. **Look for and make use of structure**	Mathematically proficient students in Kindergarten begin to look for patterns and structures in the number system and other areas of mathematics. For example, when searching for triangles around the room, kindergarteners begin to notice that some triangles are larger than others or come in different colors- yet they are all triangles. While exploring the part-whole relationships of a number using a number balance, students begin to realize that 5 can be broken down into sub-parts, such as 4 and 1 or 4 and 2, and still remain a total of 5.
8. **Look for and express regularity in repeated reasoning.**	In Kindergarten, mathematically proficient students begin to notice repetitive actions in geometry, counting, comparing, etc. For example, a kindergartener may notice that as the number of sides increase on a shape, a new shape is created (triangle has 3 sides, a rectangle has 4 sides, a pentagon has 5 sides, a hexagon has 6 sides). When counting out loud to 100, kindergartners may recognize the pattern 1-9 being repeated for each decade (e.g., Seventy-ONE, Seventy-TWO, Seventy-THREE… Eighty-ONE, Eighty-TWO, Eighty-THREE…). When joining one more cube to a pile, the child may realize that the new amount is the next number in the count sequence.

Kindergarten Critical Areas

The Critical Areas are designed to bring focus to the standards at each grade by describing the big ideas that educators can use to build their curriculum and to guide instruction. The Critical Areas for Kindergarten can be found on page 9 in the *Common Core State Standards for Mathematics*.

1. **Representing, relating, and operating on whole numbers, initially with sets of objects.**
   Students use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set; counting out a given number of objects; comparing sets or numerals; and modeling simple joining and separating situations with sets of objects, or eventually with equations such as 5 + 2 = 7 and 7 – 2 = 5. *(Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.)* Students choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away.

2. **Describing shapes and space.**
   Students describe their physical world using geometric ideas (e.g., shape, orientation, spatial relations) and vocabulary. They identify, name, and describe basic two-dimensional shapes, such as squares, triangles, circles, rectangles, and hexagons, presented in a variety of ways (e.g., with different sizes and orientations), as well as three-dimensional shapes such as cubes, cones, cylinders, and spheres. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

Counting and Cardinality	K.CC

Common Core Standard and Cluster	
Know number names and the count sequence.	
Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: number words **(zero - one hundred)**	
Common Core Standard	**Unpacking** What do these standards mean a child will know and be able to do?
K.CC.1 Count to 100 by ones and by tens.	Students rote count by starting at one and counting to 100. When students count by tens they are only expected to master counting on the decade (0, 10, 20, 30, 40 …). This objective does not require recognition of numerals. It is focused on the rote number sequence.
K.CC.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1).	Students begin a rote forward counting sequence from a number other than 1. Thus, given the number 4, the student would count, "4, 5, 6, 7 …" This objective does not require recognition of numerals. It is focused on the rote number sequence 0-100.
K.CC.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	Students write the numerals 0-20 and use the written numerals 0-20 to represent the amount within a set. For example, if the student has counted 9 objects, then the written numeral "9" is recorded. Students can record the quantity of a set by selecting a number card/tile (numeral recognition) or writing the numeral. Students can also create a set of objects based on the numeral presented. For example, if a student picks up the number card "13", the student then creates a pile of 13 counters. While children may experiment with writing numbers beyond 20, this standard places emphasis on numbers 0-20. Due to varied development of fine motor and visual development, reversal of numerals is anticipated. While reversals should be pointed out to students and correct formation modeled in instruction, the emphasis of this standard is on the use of numerals to represent quantities rather than the correct handwriting formation of the actual numeral itself.

Common Core Cluster

Count to tell the number of objects.

Students use numbers, including written numerals, to represent quantities and to solve quantitative problems such as counting objects in a set, counting out a given number of objects, and comparing sets or numerals.

When learning to count, it is important for kindergarten students to connect the collection of items (4 cubes), the number word ("four"), and the numeral (4), ultimately creating a mental picture of a number. If students simply rote-count a collection of objects without connecting these three components together, they "engage in a meaningless exercise of calling numbers that are one more than the last." (Midget, 2012) Subitizing, the ability to "instantly see how many" (Clements, 1999), helps students form a mental picture of a number. When students recognize a small collection of objects (e.g., 2 sets of two dots) as one group (e.g., four) – they are beginning to unitize. This ability to see a set of objects as a group is an important step toward being able to see smaller groups of objects within a total collection- which is necessary to decompose number. Materials such as dot cards, dice, and dominoes provide students opportunities to see a variety of patterned arrangements to develop instant recognition of small amounts.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: number words **(zero - one hundred)**

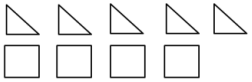
Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
K.CC.4 Understand the relationship between numbers and quantities; connect counting to cardinality.	Students count a set of objects and see sets and numerals in relationship to one another. These connections are higher-level skills that require students to analyze, reason about, and explain relationships between numbers and sets of objects. The expectation is that students are comfortable with these skills with the numbers 1-20 by the end of Kindergarten.
a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.	Students implement correct counting procedures by pointing to one object at a time (one-to-one correspondence), using one counting word for every object (synchrony/ one-to-one tagging), while keeping track of objects that have and have not been counted. This is the foundation of counting.
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.	Students answer the question "How many are there?" by counting objects in a set and understanding that the last number stated when counting a set (…8, 9, **10**) represents the total amount of objects: "There are **10** bears in this pile." (cardinality). Since an important goal for children is to count with meaning, it is important to have children answer the question, "How many do you have?" after they count. Often times, children who have not developed cardinality will count the amount again, not realizing that the **10** they stated means 10 objects in all. Young children believe what they see. Therefore, they may believe that a pile of cubes that they counted may be more if spread apart in a line. As children move towards the developmental milestone of conservation of number, they develop the understanding that the number of objects does not change when the objects are moved, rearranged, or hidden. Children need many different experiences with counting objects, as well as maturation, before they can reach this developmental milestone.

c. Understand that each successive number name refers to a quantity that is one larger.	Another important milestone in counting is inclusion (aka hierarchal inclusion). Inclusion is based on the understanding that numbers build by exactly one each time and that they nest within each other by this amount. For example, a set of three objects is nested within a set of 4 objects; within this same set of 4 objects is also a set of two objects and a set of one. Using this understanding, if a student has four objects and wants to have 5 objects, the student is able to add one more- knowing that four is within, or a sub-part of, 5 (rather than removing all 4 objects and starting over to make a new set of 5). This concept is critical for the later development of part/whole relationships. Students are asked to understand this concept with and without (0-20) objects. For example, after counting a set of 8 objects, students answer the question, "How many would there be if we added one more object?"; and answer a similar question when not using objects, by asking hypothetically, "What if we have 5 cubes and added one more. How many cubes would there be then?"
K.CC.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 1–20, count out that many objects.	In order to answer "how many?" students need to keep track of objects when counting. Keeping track is a method of counting that is used to count each item once and only once when determining how many. After numerous experiences with counting objects, along with the developmental understanding that a group of objects counted multiple times will remain the same amount, students recognize the need for keeping track in order to accurately determine "how many". Depending on the amount of objects to be counted, and the students' confidence with counting a set of objects, students may move the objects as they count each, point to each object as counted, look without touching when counting, or use a combination of these strategies. It is important that children develop a strategy that makes sense to them based on the realization that keeping track is important in order to get an accurate count, as opposed to following a rule, such as "Line them all up before you count", in order to get the right answer. As children learn to count accurately, they may count a set correctly one time, but not another. Other times they may be able to keep track up to a certain amount, but then lose track from then on. Some arrangements, such as a line or rectangular array, are easier for them to get the correct answer but may limit their flexibility with developing meaningful tracking strategies, so providing multiple arrangements help children learn how to keep track. Since scattered arrangements are the most challenging for students, this standard specifies that students only count up to 10 objects in a scattered arrangement and count up to 20 objects in a line, rectangular array, or circle.

Common Core Cluster

Compare numbers.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **greater, more, less, fewer, equal, same amount**

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
K.CC.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.[1] [1]Include groups with up to ten objects.	Students use their counting ability to compare sets of objects (0-10). They may use matching strategies (Student 1), counting strategies (Student 2) or equal shares (Student 3) to determine whether one group is greater than, less than, or equal to the number of objects in another group. Student 1 I lined up one square and one triangle. Since there is one extra triangle, there are more triangles than squares.  Student 2 I counted the squares and I got 4. Then I counted the triangles and got 5. Since 5 is bigger than 4, there are more triangles than squares. Student 3 I put them in a pile. I then took away objects. Every time I took a square, I also took a triangle. When I had taken almost all of the shapes away, there was still a triangle left. That means that there are more triangles than squares.
K.CC.7 Compare two numbers between 1 and 10 presented as written numerals.	Students apply their understanding of numerals 1-10 to compare one numeral from another. Thus, looking at the numerals 8 and 10, a student is able to recognize that the numeral 10 represents a larger amount than the numeral 8. Students need ample experiences with actual sets of objects (K.CC.3 and K.CC.6) before completing this standard with only numerals.

Operations and Algebraic Thinking K.0A

Common Core Standard and Cluster

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

For numbers 0 – 10, Kindergarten students choose, combine, and apply strategies for answering quantitative questions. This includes quickly recognizing the cardinalities of small sets of objects, counting and producing sets of given sizes, counting the number of objects in combined sets, or counting the number of objects that remain in a set after some are taken away. Objects, pictures, actions, and explanations are used to solve problems and represent thinking. Although CCSS-M states, "Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten in encouraged, but it is not required", please note that it is not until First Grade when "Understand the meaning of the equal sign" is an expectation (1.OA.7).

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **join, add, separate, subtract, and, same amount as, equal, less, more, total**

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
K.OA.1 Represent addition and subtraction with objects, fingers, mental images, drawings[2], sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. [2]Drawings need not show details, but should show the mathematics in the problem. (This applies wherever drawings are mentioned in the Standards.)	Students demonstrate the understanding of how objects can be joined (addition) and separated (subtraction) by representing addition and subtraction situations in various ways. This objective is focused on understanding the concept of addition and subtraction, rather than reading and solving addition and subtraction number sentences (equations). Common Core State Standards for Mathematics states, "Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required." Please note that it is not until First Grade when "Understand the meaning of the equal sign" is an expectation (1.OA.7). Therefore, before introducing symbols (+, -, =) and equations, kindergarteners require numerous experiences using joining (addition) and separating (subtraction) vocabulary in order to attach meaning to the various symbols. For example, when explaining a solution, kindergartens may state, "Three *and* two *is the same amount as* 5." While the meaning of the equal sign is not introduced as a standard until First Grade, if equations are going to be modeled and used in Kindergarten, students must connect the symbol (=) with its meaning (is the same amount/quantity as).
K.OA.2 Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.	Kindergarten students solve four types of problems within 10: Result Unknown/Add To; Result Unknown/Take From; Total Unknown/Put Together-Take Apart; and Addend Unknown/Put Together-Take Apart (See **Table 1** at end of document for examples of all problem types). Kindergarteners use counting to solve the four problem types by acting out the situation and/or with objects, fingers, and drawings.

Add To Result Unknown	Take From Result Unknown	Put Together/Take Apart Total Unknown	Put Together/Take Apart Addend Unknown
Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ?	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ?	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ?	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ?

	Example: **Nine grapes were in the bowl. I ate 3 grapes. How many grapes are in the bowl now?** **Student:** I got 9 "grapes" and put them in my bowl. Then, I took 3 grapes out of the bowl. I counted the grapes still left in the bowl… 1, 2, 3, 4, 4, 5, 6. Six. There are 6 grapes in the bowl. Example: **Six crayons are in the box. Two are red and the rest are blue. How many blue crayons are in the box?** **Student**: I got 6 crayons. I moved these two over and pretended they were red. Then, I counted the "blue" ones... 1, 2, 3, 4. Four. There are 4 blue crayons. 
K.OA.3 Decompose 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).	Students develop an understanding of part-whole relationships as they recognize that a set of objects (5) can be broken into smaller sub-sets (3 and 2) and still remain the total amount (5). In addition, this objective asks students to realize that a set of objects (5) can be broken in multiple ways (3 and 2; 4 and 1). Thus, when breaking apart a set (decompose), students use the understanding that a smaller set of objects exists within that larger set (inclusion). Example: **"Bobby Bear is missing 5 buttons on his jacket. How many ways can you use blue and red buttons to finish his jacket? Draw a picture of all your ideas.** Students could draw pictures of: 4 blue and 1 red button 3 blue and 2 red buttons 2 blue and 3 red buttons 1 blue and 4 red buttons In Kindergarten, students need ample experiences breaking apart numbers and using the vocabulary "and" & "same amount as" before symbols (+, =) and equations (5= 3 + 2) are introduced. If equations are used, a mathematical representation (picture, objects) needs to be present as well.

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

Students build upon the understanding that a number (less than or equal to 10) can be decomposed into parts (K.OA.3) to find a missing part of 10. Through numerous concrete experiences, kindergarteners model the various sub-parts of ten and find the missing part of 10.

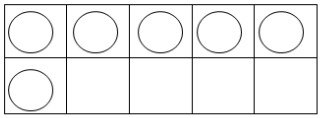
Example:
When working with 2-color beans, a student determines that 4 more beans are needed to make a total of 10.

"I have 6 beans. I need 4 more beans to have 10 in all."

In addition, kindergarteners use various materials to solve tasks that involve decomposing and composing 10.

Example:
"A full case of juice boxes has 10 boxes. There are only 6 boxes in this case. How many juice boxes are missing?

Student A:
Using a Ten-Frame
"I used a ten frame for the case. Then, I put on 6 counters for juice still in the case. There's no juice in these 4 spaces. So, 4 are missing."



Student B:
Think Addition
"I counted out 10 counters because I knew there needed to be ten. I pushed these 6 over here because they were in the container. These are left over. So there's 4 missing."

Student C:
Fluently add/subtract
"I know that it's 4 because 6 and 4 is the same amount as 10."

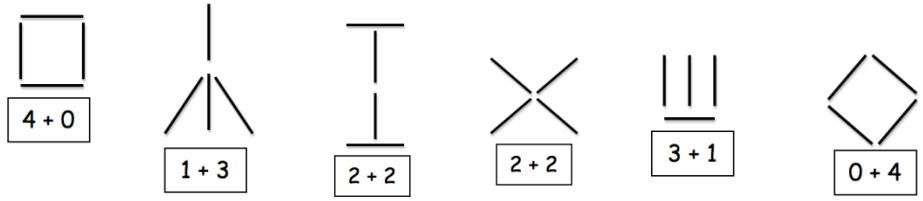
K.OA.5 Fluently add and subtract within 5.

Students are fluent when they display accuracy (correct answer), efficiency (a reasonable amount of steps in about 3-5 seconds* without resorting to counting), and flexibility (using strategies such as the distributive property).

Students develop fluency by understanding and internalizing the relationships that exist between and among numbers. Oftentimes, when children think of each "fact" as an individual item that does not relate to any other "fact", they are attempting to memorize separate bits of information that can be easily forgotten. Instead, in order to fluently add and subtract, children must first be able to see sub-parts within a number (inclusion, K.CC.4.c).

Once they have reached this milestone, children need repeated experiences with many different types of concrete materials (such as cubes, chips, and buttons) over an extended amount of time in order to recognize that there are only particular sub-parts for each number. Therefore, children will realize that if 3 and 2 is a combination of 5, then 3 and 2 cannot be a combination of 6.

For example, after making various arrangements with toothpicks, students learn that only a certain number of sub-parts exist within the number 4:



Then, after numerous opportunities to explore, represent and discuss "4", a student becomes able to fluently answer problems such as, "One bird was on the tree. Three more birds came. How many are on the tree now?"; and "There was one bird on the tree. Some more came. There are now 4 birds on the tree. How many birds came?".

Traditional flash cards or timed tests have not been proven as effective instructional strategies for developing fluency.** Rather, numerous experiences with breaking apart actual sets of objects and developing relationships between numbers help children internalize parts of number and develop efficient strategies for fact retrieval.

* Van de Walle & Lovin (2006). Teaching student centered mathematics K-3 (p.94). Boston: Pearson.
**Burns (2000) *About Teaching Mathematics*; Fosnot & Dolk (2001) *Young Mathematicians at Work;* Richardson (2002) *Assessing Math Concepts*; Van de Walle & Lovin (2006) *Teaching Student-Centered Mathematics*

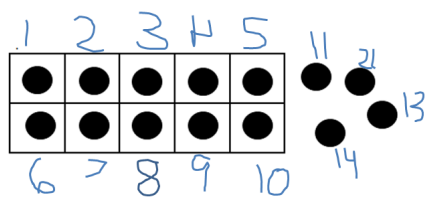
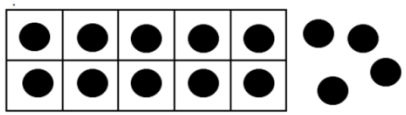
Number and Operations in Base Ten — K.NBT

Common Core Standard and Cluster

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

Rather than unitizing a ten (recognizing that a set of 10 objects is a unit called a "ten"), which is a standard for First Grade (1.NBT.1a), kindergarteners keep each count as a single unit as they explore a set of 10 objects and leftovers.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: number words (**one, two… thirteen, fourteen, … nineteen**), **leftovers**

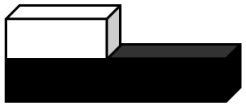
Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
K.NBT.1 Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8)*; understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones. * Kindergarten students should see addition and subtraction equations, and student writing of equations in kindergarten is encouraged, but it is not required.	Students explore numbers 11-19 using representations, such as manipulatives or drawings. Keeping each count as a single unit, kindergarteners use 10 objects to represent "10" rather than creating a unit called a ten (unitizing) as indicated in the First Grade CCSS standard 1.NBT.1a: 10 can be thought of as a bundle of ten ones — called a "ten." <u>Example</u>: **Teacher**: "I have some chips here. Do you think they will fit on our ten frame? Why? Why Not?" **Students**: Share thoughts with one another. **Teacher**: "Use your ten frame to investigate." **Students**: "Look. There's too many to fit on the ten frame. Only ten chips will fit on it." **Teacher**: "So you have some leftovers?" **Students**: "Yes. I'll put them over here next to the ten frame." **Teacher**: "So, how many do you have in all?" **Student A**: "One, two, three, four, five… ten, eleven, twelve, thirteen, fourteen. I have fourteen. Ten fit on and four didn't." **Student B**: Pointing to the ten frame, "See them- that's 10… 11, 12, 13, 14. There's fourteen." **Teacher**: Use your recording sheet (or number sentence cards) to show what you found out. <u>Student Recording Sheets Example</u>:  14 is 10 on and 4 off. ALL / On / Off 14 / 10 / 4  14 = 10 + 4

Measurement and Data K.MD

Common Core Standard and Cluster

Describe and compare measurable attributes.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **length, weight, heavy, long, more of, less of, longer, taller, shorter.**

Common Core Standard	Unpacking What do these standards mean a child will know and be able to do?
K.MD.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.	Students describe measurable attributes of objects, such as length, weight, size, and color. For example, a student may describe a shoe with one attribute, "Look! My shoe is blue, too!", or more than one attribute, "This shoe is heavy! It's also really long." Students often initially hold undifferentiated views of measurable attributes, saying that one object is "bigger" than another whether it is longer, or greater in area, or greater in volume, and so forth. For example, two students might both claim their block building is "the biggest." Conversations about how they are comparing- one building may be taller (greater in length) and another may have a larger base (greater in area)- help students learn to discriminate and name these measureable attributes. As they discuss these situations and compare objects using different attributes, they learn to distinguish, label, and describe several measureable attributes of a single object. Thus, teachers listen for and extend conversations about things that are "big", or "small," as well as "long," "tall," or "high," and name, discuss, and demonstrate with gestures the attribute being discussed. *Progressions for the CCSSM: Geometric Measurement*, The CCSS Writing Team, June 2012.
K.MD.2 Directly compare two objects with a measurable attribute in common, to see which object 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.*	Direct comparisons are made when objects are put next to each other, such as two children, two books, two pencils. For example, a student may line up two blocks and say, "The blue block is a lot longer than the white one." Students are not comparing objects that cannot be moved and lined up next to each other.  Similar to the development of the understanding that keeping track is important to obtain an accurate count, kindergarten students need ample experiences with comparing objects in order to discover the importance of lining up the ends of objects in order to have an accurate measurement.

	As this concept develops, children move from the idea that "Sometimes this block is longer than this one and sometimes it's shorter (depending on how I lay them side by side) and that's okay." to the understanding that "This block is always longer than this block (with each end lined up appropriately)." Since this understanding requires conservation of length, a developmental milestone for young children, kindergarteners need multiple experiences measuring a variety of items and discussing findings with one another.  "Sometimes this block is longer and sometimes it's shorter."  "The dark block is always longer than this block" As students develop conservation of length, learning and using language such as "It looks longer, but it really isn't longer" is helpful.

Common Core Cluster	
Classify objects and count the number of objects in each category.	
Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: color words **(e.g., blue, green, red,** etc**.),** descriptive words (e.g., **small, big, rough, smooth, bumpy, round, flat,** etc.), **more, less, same amount**	
Common Core Standard	**Unpacking** What do these standards mean a child will know and be able to do?
K.MD.3 Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. *(Limit category counts to be less than or equal to 10)*	Students identify similarities and differences between objects (e.g., size, color, shape) and use the identified attributes to sort a collection of objects. Once the objects are sorted, the student counts the amount in each set. Once each set is counted, then the student is asked to sort (or group) each of the sets by the amount in each set. Thus, like amounts are grouped together, but not necessarily ordered. <u>For example</u>, **when exploring a collection of buttons:** First, the student separates the buttons into different piles based on color (all the blue buttons are in one pile, all the orange buttons are in a different pile, etc.). Then the student counts the number of buttons in each pile: blue (5), green (4), orange (3), purple (4). Finally, the student organizes the groups by the quantity. "I put the purple buttons next to the green buttons because purple also had (4). Blue has 5 and orange has 3. There aren't any other colors that have 5 or 3. So they are sitting by themselves." This objective helps to build a foundation for data collection in future grades as they create and analyze various graphical representations.

Geometry K.G

Common Core Standard and Cluster

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

This entire cluster asks students to understand that certain attributes define what a shape is called (number of sides, number of angles, etc.) and other attributes do not (color, size, orientation). Using geometric attributes, the student identifies and describes squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres. Throughout the year, Kindergarten students move from informal language to describe what shapes look like (e.g., "That looks like an ice cream cone!") to more formal mathematical language (e.g., "That is a triangle. All of its sides are the same length").

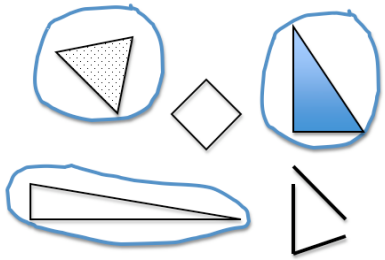
In Kindergarten, students need ample experiences exploring various forms of the shapes (e.g., *size*: big and small; *types*: triangles, equilateral, isosceles, scalene; *orientation*: rotated slightly to the left, 'upside down') using geometric vocabulary to describe the different shapes.

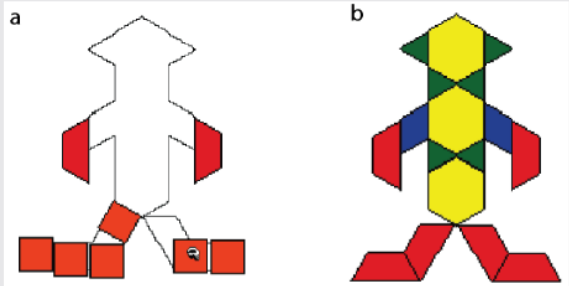
Students in Kindergarten typically recognize figures by appearance alone, often by comparing them to a known example of a shape, such as the triangle on the left (see below). For example, students in Kindergarten typically recognize that the figure on the left as a triangle, but claim that the figure on the right is not a triangle, since it does not have a flat bottom. Thus, the properties of a figure are not recognized or known. Students typically make decisions on identifying and describing shapes based on perception, not reasoning.

Mathematically proficient students communicate precisely by engaging in discussion about their reasoning using appropriate mathematical language. The terms students should learn to use with increasing precision with this cluster are: **squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, spheres, flat, solid, side, corner, angle, edge, face,** positional vocabulary (e.g., **above, below, beside, in front of, behind, next to, same, different,** etc.).

Common Core Standards	Unpacking What do these standards mean a child will know and be able to do?
K.G.1 Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as *above*, *below*, *beside*, *in front of*, *behind*, and *next to*.	Students locate and identify shapes in their environment. For example, a student may look at the tile pattern arrangement on the hall floor and say, "Look! I see squares! They are next to the triangle." At first students may use informal names e.g., "balls," "boxes," "cans". Eventually students refine their informal language by learning mathematical concepts and vocabulary and identify, compare, and sort shapes based on geometric attributes.* Students also use positional words (such as those italicized in the standard) to describe objects in the environment, developing their spatial reasoning competencies. Kindergarten students need numerous experiences identifying the location and position of actual two-and-three-dimensional objects in their classroom/school prior to describing location and position of two-and-three-dimension representations on paper. **Progressions for the CCSS in Mathematics: Geometry*, The Common Core Standards Writing Team, June 2012

K.G.2 Correctly name shapes regardless of their orientations or overall size.	Through numerous experiences exploring and discussing shapes, students begin to understand that certain attributes define what a shape is called (number of sides, number of angles, etc.) and that other attributes do not (color, size, orientation). As the teacher facilitates discussions about shapes ("Is it still a triangle if I turn it like this?"), children question what they "see" and begin to focus on the geometric attributes. Kindergarten students typically do not yet recognize triangles that are turned upside down as triangles, since they don't "look like" triangles. Students need ample experiences manipulating shapes and looking at shapes with various typical and atypical orientations. Through these experiences, students will begin to move beyond what a shape "looks like" to identifying particular geometric attributes that define a shape.
K.G.3 Identify shapes as two-dimensional (lying in a plane, "flat") or three dimensional ("solid").	Students identify objects as flat (2 dimensional) or solid (3 dimensional). As the teacher embeds the vocabulary into students' exploration of various shapes, students use the terms two-dimensional and three-dimensional as they discuss the properties of various shapes.

Common Core Cluster	
Analyze, compare, create, and compose shapes.	
Common Core Standard	**Unpacking** What do these standards mean a child will know and be able to do?
K.G.4 Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).	Students relate one shape to another as they note similarities and differences between and among 2-D and 3-D shapes using informal language. For example, when comparing a triangle and a square, they note that they both are closed figures, have straight sides, but the triangle has 3 sides while the square has 4. Or, when building in the Block Center, they notice that the faces on the cube are all square shapes. Kindergarteners also distinguish between the most typical examples of a shape from obvious non-examples. <u>For example:</u> When identifying the triangles from a collection of shapes, a student circles all of the triangle examples from the non-examples. 

K.G.5 Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.	Students apply their understanding of geometric attributes of shapes in order to create given shapes. For example, students may roll a clump of play-doh into a sphere or use their finger to draw a triangle in the sand table, recalling various attributes in order to create that particular shape.
K.G.6 Compose simple shapes to form larger shapes. For example, "Can you join these two triangles with full sides touching to make a rectangle?"	This standard moves beyond identifying and classifying simple shapes to manipulating two or more shapes to create a new shape. This concept begins to develop as students move, rotate, flip, and arrange puzzle pieces to complete a puzzle. Kindergarteners use their experiences with puzzles to use simple shapes to create different shapes. <u>For example</u>, when using basic shapes to create a picture, a student flips and turns triangles to make a rectangular house. Students also combine shapes to build pictures. They first use trial and error (part a) and gradually consider components (part b)*. **Combining shapes to build pictures**  **Progressions for the Common Core State Standards in Mathematics: Geometry*, The Common Core Standards Writing Team, June 2012

Glossary

Table 1 Common addition and subtraction situations[1]

	Result Unknown	Change Unknown	Start Unknown
Add to	Two bunnies sat on the grass. Three more bunnies hopped there. How many bunnies are on the grass now? 2 + 3 = ? **(K)**	Two bunnies were sitting on the grass. Some more bunnies hopped there. Then there were five bunnies. How many bunnies hopped over to the first two? 2 + ? = 5 **(1st)**	Some bunnies were sitting on the grass. Three more bunnies hopped there. Then there were five bunnies. How many bunnies were on the grass before? ? + 3 = 5 **One-Step Problem** **(2nd)**
Take from	Five apples were on the table. I ate two apples. How many apples are on the table now? 5 – 2 = ? **(K)**	Five apples were on the table. I ate some apples. Then there were three apples. How many apples did I eat? 5 – ? = 3 **(1st)**	Some apples were on the table. I ate two apples. Then there were three apples. How many apples were on the table before? ? – 2 = 3 **One-Step Problem** **(2nd)**

	Total Unknown	Addend Unknown	Both Addends Unknown[2]
Put Together/ Take Apart[3]	Three red apples and two green apples are on the table. How many apples are on the table? 3 + 2 = ? **(K)**	Five apples are on the table. Three are red and the rest are green. How many apples are green? 3 + ? = 5, 5 – 3 = ? **(K)**	Grandma has five flowers. How many can she put in her red vase and how many in her blue vase? 5 = 0 + 5, 5 = 5 + 0 5 = 1 + 4, 5 = 4 + 1 5 = 2 + 3, 5 = 3 + 2 **(1st)**

	Difference Unknown	Bigger Unknown	Smaller Unknown
Compare[4]	("How many more?" version): Lucy has two apples. Julie has five apples. How many more apples does Julie have than Lucy? **(1st)**	(Version with "more"): Julie has three more apples than Lucy. Lucy has two apples. How many apples does Julie have? **One-Step Problem** **(1st)**	(Version with "more"): Julie has 3 more apples than Lucy. Julie has five apples. How many apples does Lucy have? 5 – 3 = ? ? + 3 = 5 **One-Step Problem** **(2nd)**
	("How many fewer?" version): Lucy has two apples. Julie has five apples. How many fewer apples does Lucy have than Julie? 2 + ? = 5, 5 – 2 = ? **(1st)**	(Version with "fewer"): Lucy has 3 fewer apples than Julie. Lucy has two apples. How many apples does Julie have? 2 + 3 = ?, 3 + 2 = ? **One-Step Problem** **(2nd)**	(Version with "fewer"): Lucy has three fewer apples than Julie. Julie has five apples. How many apples does Lucy have? **One-Step Problem** **(1st)**

K: Problem types to be mastered by the end of the Kindergarten year.
1st: Problem types to be mastered by the end of the First Grade year, including problem types from the previous year. However, First Grade students should have experiences with all 12 problem types.
2nd: Problem types to be mastered by the end of the Second Grade year, including problem types from the previous years.

1Adapted from Box 2-4 of Mathematics Learning in Early Childhood, National Research Council (2009, pp. 32, 33).

2These take apart situations can be used to show all the decompositions of a given number. The associated equations, which have the total on the left of the equal sign, help children understand that the = sign does not always mean makes or results in but always does mean is the same number as.

3Either addend can be unknown, so there are three variations of these problem situations. Both Addends Unknown is a productive extension of this basic situation, especially for small numbers less than or equal to 10.

4For the Bigger Unknown or Smaller Unknown situations, one version directs the correct operation (the version using more for the bigger unknown and using less for the smaller unknown). The other versions are more difficult.

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