EL Education

READ ME FIRST – Overview of EL Education's Common Core Learning Targets

What We Have Created and Why

- A group of 15 EL staff members wrote long-term learning targets aligned with the Common Core State Standards for English Language Arts (K-12), Disciplinary Reading (6-12), and Math.
- EL is committed to purposeful learning; to that end, learning targets are a key resource for students, teachers, and instructional leaders. Our hope is that these targets help launch teachers into what we've learned is the most powerful work: *engaging students* with targets during the learning process.
- The Common Core State Standards (CCSS) unite us nationally. The standards, along with these long-term learning targets provide us with a common framework and language.
- We offer these targets as an open educational resource (OER), intended to be shared publicly at no charge.

Next Steps for Schools and Teachers

- **Determine importance and sort for long-term vs. supporting targets.**
  In most cases, there are more targets here than teachers can realistically instruct to and assess, and not each target is "worthy" of being a long-term target. We suggest that leadership teams, disciplinary teams, or grade-level teams analyze these targets to determine which ones you consider to be truly long-term versus supporting. Reorganize them as necessary to make them yours.
- **Build out contextualized supporting targets and assessments,** looking back at the full text of the standard. Our intention is to offer a "clean translation" of the standards in student-friendly language to serve as a jumping-off point for teachers when developing daily targets used with students during instruction and formative assessment.

Resources

- A specific resource we recommend is *The Common Core: Clarifying Expectations for Teachers & Students* (2012), by Align Assess, Achieve, LLC and distributed through McGraw Hill. These are a series of grade level booklets for Math, ELA, and Literacy in Science, Social Studies & Technology. They include enduring understandings, essential questions, suggested daily-level learning targets and vocabulary broken out by cluster and standard. Find more information at http://www.mheonline.com/aaa/index.php?page=flipbooks. (Each grade-level booklet costs $15-25.)
- We also recommend installing the free Common Core Standards app by MasteryConnect. It's very useful to have the standards at your fingertips! http://itunes.apple.com/us/app/common-core-standards/id439424555?mt=8

EL Education

Common Core State Standards & Long-Term Learning Targets
Math, Grades 3-5

See page 8 for Grade 4
See page 15 for Grade 5

Grade level	**3**
Discipline(s)	CCSS - Math
Dates	April, 2012
Author(s)	Dirk Matthias & Myra Brooks

"Fluency" is defined as accuracy, efficiency, and flexibility. (Russell, S. J. (2000). Developing computational fluency with whole numbers in the elementary grades. *The New England Math Journal, 32*(2), 40-54.)

CCS Standards: Operations and Algebraic Thinking	Long-Term Target(s)
3.OA.1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5 × 7.*	I can use multiplication to solve problems. I can represent the context of a multiplication problem using drawings and equations.
3.OA.2. Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56 ÷ 8.*	I can use division to solve problems. I can represent the context of a division problem using drawings and equations.
3.OA.3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See glossary, Table 2)	I can use multiplication and division (within 100) to solve word problems. I can represent the context of a multiplication and division problem using drawings and equations. I can fluently use the models of multiplication.

EL Education

CCS Standards: Operations and Algebraic Thinking	Long-Term Target(s)
3.OA.4. Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = _ ÷ 3, 6 × 6 = ?	I can find an unknown number in a multiplication or division equation.
3.OA.5. Apply properties of operations as strategies to multiply and divide.[2] (Students need not use formal terms for these properties.) Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)	I can analyze the relationship between the four basic operations. I can follow the rules of multiplication and division. I can use the properties of operations as strategies to help me multiply and divide.
3.OA.6. Understand division as an unknown-factor problem. For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.	I can explain the relationship between multiplication and division.
3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	I can fluently multiply and divide within 100. I can say from memory every multiplication fact 0-10. I can use my fluency with the multiplication facts 0-10 to help me divide.
3.OA.8. Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.[3] (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order.)	I can use all four operations to solve two-step word problems. I can represent the context of a word problem with pictures, models, equations and/or variables. I can check the reasonableness of my answer using a variety of strategies.
3.OA.9. Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	I can identify arithmetic patterns. I can explain arithmetic patterns using the properties of operations.

EL Education

CCS Standards: Number and Operations in Base Ten	Long-Term Target(s)
3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100.	I can explain what each digit of a three-digit number represents. I can name the place values of numbers (up to 100). I can round whole numbers to the nearest 10 or 100.
3.NBT.2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	I can explain the relationship between addition and subtraction. I can fluently add and subtract within 1000 using a variety of strategies.
3.NBT.3. Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations.	I can use the properties of operations and place value as strategies to help me multiply fluently (one-digit whole numbers by multiples of 10 in the range of 10-90).
CCS Standards: Number and Operations – Fractions **Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, 8**	**Long-Term Target(s)**
3.NF.1. Understand a fraction $1/b$ as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by a parts of size $1/b$.	I can explain what fractions represent. I can recognize fractional parts of a whole.

EL Education

CCS Standards: Number and Operations – Fractions Grade 3 expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, 8	Long-Term Target(s)
3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram. a. Represent a fraction $1/b$ on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size $1/b$ and that the endpoint of the part based at 0 locates the number $1/b$ on the number line. b. Represent a fraction a/b on a number line diagram by marking off a lengths $1/b$ from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line. [1] Excludes compound units such as cm3 and finding the geometric volume of a container. [2] Excludes multiplicative comparison problems (problems involving notions of "times as much"; see Glossary, Table 2).	I can explain what fractions represent using a number line. I can plot fractions on a number line.
3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. b. Recognize and generate simple equivalent fractions, e.g., $1/2 = 2/4$, $4/6 = 2/3$). Explain why the fractions are equivalent, e.g., by using a visual fraction model. c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form $3 = 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram. d. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	I can explain the concept of equivalence. I can reason about fraction size and equivalence using models. I can create equivalent fractions. I can compare two fractions using appropriate mathematical symbols (<, >, =).

EL Education

CCS Standards: Measurement and Data	Long-Term Target(s)
3.MD.1. Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	I can tell time to the nearest minute. I can use addition and subtraction to solve word problems involving time.
3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.	I can measure liquid volumes and masses of objects using standard units (grams, kilograms, and liters). I can estimate liquid volumes and masses of objects using standard units (grams, kilograms, and liters). I can use models to represent the context of a measurement problem. I can solve problems involving liquid volumes and masses of objects.
3.MD.3. Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. *For example, draw a bar graph in which each square in the bar graph might represent 5 pets.*	I can draw a scaled graph (picture and bar) to represent a data set with several categories. I can use a scaled bar graph to solve problems.
3.MD.4. Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.	I can use a ruler to measure lengths accurately to fourths of an inch. I can draw a line plot to represent a data set (using a horizontal scale of appropriate units).
3.MD.5. Recognize area as an attribute of plane figures and understand concepts of area measurement. a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area. b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	I can explain the concept of area measurement. I can describe the area of an object using appropriate units.
3.MD.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	I can find the area of objects using a variety of methods.

EL Education

CCS Standards: Measurement and Data	Long-Term Target(s)
3.MD.7. Relate area to the operations of multiplication and addition. a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning. c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	I can analyze the relationship between the concepts of area, multiplication, and addition. I can solve word problems involving area of rectangular figures. I can use models to represent the context of an area problem.
3.MD.8. Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	I can solve problems involving perimeter of polygons. I can compare the perimeter and area of polygons.
CCS Standards: Geometry	**Long-Term Target(s)**
3.G.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	I can identify basic geometric shapes by name and attributes. I can compare geometric shapes using their attributes. I can recognize common examples and non-examples of quadrilaterals.
3.G.2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.	I can divide shapes into equal parts. I can express the parts of a shape as fractions.

EL Education

Common Core State Standards & Long-Term Learning Targets
Math, Grades 4

Grade level	4
Discipline(s)	CCSS - Math
Dates	April, 2012
Author(s)	Dirk Matthias & Myra Brooks

"Fluency" is defined as accuracy, efficiency, and flexibility. (Russell, S. J. (2000). Developing computational fluency with whole numbers in the elementary grades. *The New England Math Journal, 32*(2), 40-54.)

CCS Standards: Operations and Algebraic Thinking	Long-Term Target(s)
4.OA.1. Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	I can explain what a multiplication equation represents.
4.OA.2. Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.[1] (See Glossary, Table 2)	I can explain the relationship between multiplication and addition. I can use multiplication and division to solve problems. I can represent the context of a multiplication and division word problem using drawings and equations.
4.OA.3. Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	I can solve multi-step word problems using all four operations. I can represent the context of a word problem, (including problems with remainders) using drawings and equations. I can use variables to represent unknown quantities in a problem. I can check the reasonableness of my answer using a variety of strategies.

CCS Standards: Operations and Algebraic Thinking	Long-Term Target(s)
4.OA.4. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	I can name the factors of all whole numbers 0-100. I can explain the relationship between factors and multiples. I can determine whether any number 0-100 is a multiple of a given one-digit number. I can determine whether any number 0-100 is prime or composite.
4.OA5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	I can create a number or shape pattern that follows a rule. I can describe what I notice about the pattern besides the rule itself.
CCS Standards: Number and Operations in Base Ten **Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000**	**Long-Term Target(s)**
4.NBT.1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*	I can explain the relationship between digits in different places within a whole number.
4.NBT.2. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	I can read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. I can compare multi-digit numbers using the symbols >, =, and <.
4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place.	I can round multi-digit whole numbers to a given place.

CCS Standards: Number and Operations in Base Ten **Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000**	**Long-Term Target(s)**
4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	I can explain the relationship between addition and subtraction. I can add and subtract multi-digit whole numbers fluently.
4.NBT.5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can multiply whole numbers using a variety of strategies. (4 digits x 1 digit; 2 digits x 2 digits). I can prove my calculations are correct using equations, rectangular arrays, and/or area models.
4.NBT.6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can explain the relationship between multiplication and division. I can find whole-number quotients and remainders using a variety of strategies. I can prove my calculations are correct using equations, rectangular arrays, and/or area models.
CCS Standards: Number and Operations – Fractions **Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.**	**Long-Term Target(s)**
4.NF.1. Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	I can explain the concept of fraction equivalence. I can create equivalent fractions. I can reason about fraction size and equivalence using visual models.

CCS Standards: Number and Operations – Fractions **Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.**	**Long-Term Target(s)**
4.NF.2. Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	I can compare two fractions with different numerators and denominators using appropriate mathematical symbols (<, >, =). I can prove my fraction comparisons using visual models.
4.NF.3. Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	I can describe a fraction as the sum of smaller fractions. I can prove my fraction decomposition using equations and visual models. I can add and subtract fractions and mixed numerals with like denominators using a variety of strategies. I can solve problems involving addition and subtraction of fractions (with like denominators). I can represent the context of a fraction word problem using a variety of models.

EL Education

CCS Standards: Number and Operations – Fractions **Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.**	**Long-Term Target(s)**
4.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction *a/b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).* *b.* Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)* c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	I can multiply a fraction by a whole number. I can represent fractions using various multiplication equations. I can solve word problems involving multiplication of fractions by a whole number.
4.NF.5. Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.) *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*	I can create equivalent fractions whose denominators are 10 and 100. I can add fractions with denominators of 10 and 100. I can explain my strategies for adding fractions.
4.NF.6. Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*	I can explain the relationship between decimals and fractions. I can use decimals to describe fractions with denominators of 10 and 100.

EL Education

CCS Standards: Number and Operations – Fractions Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12, 100.	Long-Term Target(s)
4.NF.7. Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	I can compare two decimals to the hundredths place using appropriate mathematical symbols (<, >, =). I can prove my decimal comparisons using models.
CCS Standards: Measurement and Data	**Long-Term Target(s)**
4.MD.1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*	I can describe the approximate sizes of units within one measurement system (metric, standard, time, etc.). I can compare larger and smaller units within the same measurement system. I can convert a given measurement into an equivalent unit.
4.MD.2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	I can solve measurement word problems involving distances, time, mass, volume, and money. I can represent measurement quantities using diagrams (with a measurement scale).
4.MD.3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*	I can use area and perimeter formulas to solve problems. I can represent the context of an area and perimeter word problem using a variety of models.
4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*	I can make a line plot to display a data set involving fractions of a measurement unit. I can use a line plot to solve fraction word problems involving addition and subtraction.

EL Education

CCS Standards: Measurement and Data	Long-Term Target(s)
4.MD.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	I can describe angles using geometric vocabulary. I can explain how to measure an angle.
4.MD.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	I can measure and draw angles using a protractor.
4.MD.7. Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	I can determine the measurement of a larger angle using smaller angle measurements. I can find unknown angles using a variety of strategies. I can solve word problems that involve unknown angle measurements.
CCS Standards: Geometry	**Long-Term Target(s)**
4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	I can draw points, lines (parallel and perpendicular), line segments, rays, and angles (right, acute, obtuse). I can identify points, lines, line segments, rays, and angles in other shapes.
4.G.2. Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.	I can classify shapes based on lines and angles. I can identify right triangles.
4.G.3. Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	I can identify a line of symmetry in a two-dimensional figure. I can recognize when a figure is symmetrical and when it is not. I can draw lines of symmetry (two-dimensional).

EL Education

Common Core State Standards & Long-Term Learning Targets
Math, Grade 5

Grade level	**5**
Discipline(s)	CCSS - Math
Dates	April, 2012
Author(s)	Dirk Matthias & Myra Brooks

"Fluency" is defined as accuracy, efficiency, and flexibility. (Russell, S. J. (2000). Developing computational fluency with whole numbers in the elementary grades. *The New England Math Journal, 32*(2), 40-54.)

CCS Standards: Operations and Algebraic Thinking	Long-Term Target(s)
5.OA.1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	I can communicate using mathematical symbols (parentheses, brackets, braces). I can evaluate expressions that involve parentheses, brackets, and/or braces.
5.OA.2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	I can translate words into expressions. I can explain the relationship between numbers in an expression (without any calculations).
5.OA.3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	I can analyze patterns based on relationships and operations. I can create numeric patterns using given rules. I can graph ordered pairs on a coordinate plane.

EL Education

CCS Standards: Number and Operations in Base Ten	Long-Term Target(s)
5.NBT.1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	I can explain the relationship between digits in different decimal places.
5.NBT.2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	I can explain the connection between the number of zeros in a number and the multiples of 10. I can explain the connection between the decimal point and multiplying/dividing by 10. I can use exponents to show powers of 10.
5.NBT.3. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., $347.392 = 3 \times 100 + 4 \times 10 + 7 \times 1 + 3 \times (1/10) + 9 \times (1/100) + 2 \times (1/1000)$. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	I can read, write, and compare decimals to the thousandths place. I can explain decimals using base-ten numerals, number names, and expanded form. I can compare decimals using the symbols >, =, and <.
5.NBT.4. Use place value understanding to round decimals to any place.	I can round decimals to any given place.
5.NBT.5. Fluently multiply multi-digit whole numbers using the standard algorithm.	I can fluently multiply multi-digit whole numbers.
5.NBT.6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	I can explain the relationship between multiplication and division. I can find quotients using a variety of strategies. I can prove my calculations are correct using equations, rectangular arrays, and/or area models.
5.NBT.7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	I can add, subtract, multiply, and divide decimals using a variety of strategies. I can explain the relationship between addition and subtraction. I can prove my calculations are correct using models. I can explain my reasoning and solutions to decimal

	problems in writing.
CCS Standards: Number and Operations – Fractions	**Long-Term Target(s)**
5.NF.1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	I can add and subtract fractions and mixed numbers with unlike denominators.
5.NF.2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*	I can solve word problems involving addition and subtraction of fractions (with unlike denominators). I can represent the context of a fraction word problem using a variety of models. I can use benchmark fractions and number sense to check for reasonable answers.
5.NF.3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	I can explain the relationship between fractions and division. I can solve word problems involving division and express my answers in fraction form. I can represent the context of a fraction word problem using a variety of models.

EL Education

CCS Standards: Number and Operations – Fractions	Long-Term Target(s)
5.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$. For example, use a visual fraction model to show $(2/3) \times 4 = 8/3$, and create a story context for this equation. Do the same with $(2/3) \times (4/5) = 8/15$. (In general, $(a/b) \times (c/d) = ac/bd$.) b. Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.	I can multiply a whole number or fraction by a fraction. I can prove my product is correct using visual models. I can solve word problems involving multiplication by fractions. I can find the area of a rectangle (with fractional side lengths) using a variety of strategies.
5.NF.5. Interpret multiplication as scaling (resizing), by: a. Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. b. Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.	I can compare the size of a product to the size of its factors (without performing multiplication). I can explain the result of multiplying a given number by a fraction greater than and less than 1.
5.NF.6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.	I can solve word problems involving multiplication by fractions and mixed numbers. I can represent the context of a fraction word problem using a variety of models.

CCS Standards: Number and Operations – Fractions	Long-Term Target(s)
5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.[1] a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.* b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* c. Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?* (Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.)	I can explain the relationship between multiplication, division, and fractions. I can represent the context of a word problem (involving division of fractions) using models and equations. I can solve word problems involving division of fractions using a variety of strategies.
CCS Standards: Measurement and Data	**Long-Term Target(s)**
5.MD.1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	I can convert among units within one measurement system (metric, standard, time, etc.). I can solve measurement word problems involving conversions. I can represent the context of the measurement word problem using a variety of models.

EL Education

CCS Standards: Measurement and Data	Long-Term Target(s)
5.MD.2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	I can make a line plot to display a data set involving fractions of a measurement unit. I can use information from a line plot to solve problems.
5.MD.3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	I can explain the concept of volume using unit cubes. I can explain the difference between the volumes of two- and three-dimensional (solid) figures.
5.MD.4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	I can measure the volume of objects using a variety of methods and the appropriate units.
5.MD.5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. b. Apply the formulas $V = l \times w \times h$ and $V = b \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	I can explain the relationship between the concepts of volume, multiplication, and addition. I can solve real-word problems involving volume. I can represent the context of a volume problem using models.

CCS Standards: Geometry	Long-Term Target(s)
5.G.1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).	I can describe a coordinate system using correct vocabulary (axes, origin, points, plane, coordinates, quadrants).
5.G.2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.	I can graph points on a coordinate plane. I can represent the context of a problem using a coordinate plane. I can explain the meaning of the graph within the context of a real-world problem.
5.G.3. Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.	I can reason using the attributes and categories of geometric figures.
5.G.4. Classify two-dimensional figures in a hierarchy based on properties.	I can classify shapes based on properties.