

The STAR Program

Strategies for Teaching based on Autism Research

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Grades K-4 Math

Relationship Between the Common Core & Common Core Essential Elements and The STAR Program Lessons

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Kindergarten Mathematics Standards: Counting and Cardinality			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Know number names and the count sequence			
K.CC.1. Count to 100 by ones and by tens.			L2/A1, L2/A3 L3/A1, L3/A2
K.CC.2. Count forward beginning from a given number within the known sequence (instead of having to begin at one).			
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).			L2/A12
Count to tell the number of objects			
K.CC.4. Understand the relationship between numbers and quantities; connect counting to cardinality. 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. 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.			L2/A2, L3/A4
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.			L2/A5
Compare Numbers			
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.			L3/S3, L2/A5
KK.CC.7. Compare two numbers between 1 and 10 presented as written numerals.			L2/A3

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Kindergarten Mathematics Standards: Operations and Algebraic Thinking			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from</i>			
K.OA.1. Represent addition and subtraction with objects, fingers, mental images, drawings ¹ , sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.			L3/A5, L3/A6
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.			L3/A5, L3/A6
K.OA.3. Decompose numbers less than or equal to 10 into pairs in more than one way by using objects or drawings, and record each decomposition by a drawing or equation (e.g., $5 = 2 + 3$ and $5 = 4 + 1$).			L3/A5, L3/A6
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			L3/A5, L3/A6
K.OA.5. Fluently add and subtract within 5.			L3/A5, L3/A6
First Grade Mathematics Standards: Operations and Algebraic Thinking			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Represent and solve problems involving addition and subtraction</i>			
1.OA.1. Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem. ¹			
	EE1.OA.1.a. Use language to describe putting together and taking apart, aspects of addition and subtraction.	Level IV AA Students will: EE1.OA.1.a. Use words like take away, subtract, give, add, more, and same quantity, when putting together and taking apart.	L3/A5, L3/A6 L3/S3
	EE1.OA.1.b. Recognize two groups that have the same or equal quantity.	Level IV AA Students will: EE1.OA.1.b. Create two groups that have the same or equal quantity.	L3/R3, L2/A2
1.OA.2. Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20, e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE1.OA.2. Use “putting together” to solve problems with two sets.	Level IV AA Students will: EE1.OA.2. Use “putting together” to solve problems using three sets.	L2/A5, L3/S3
<i>Understand and apply properties of operations and the relationship between addition and subtraction</i>			
1.OA.3. Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a 10, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)			
1.OA.4. Understand subtraction as an unknown-addend problem. For example, subtract $10 - 8$ by finding the number that makes 10 when added to 8.			
<i>Add and subtract within 20</i>			
1.OA.5. Relate counting to addition and subtraction (e.g., by counting on 2 to add 2).			
	EE1.OA.5.a. Use manipulatives or visual representations to indicate the number that results when adding one more.	Level IV AA Students will: EE1.OA.5.a. Indicate the numeral that results when adding one more to the numbers.	L3/A5, L3/S3
	EE1.OA.5.b. Apply knowledge of “one less” to subtract one from the numbers.	Level IV AA Students will: EE1.OA.5.b. Indicate the numeral that is one less.	L3/A6, L3/S3
1.OA.6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g., $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$); decomposing a number leading to a ten (e.g., $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$); using the relationship between addition and subtraction (e.g., knowing that $8 + 4 = 12$, one knows $12 - 8 = 4$); and creating equivalent but easier or known sums (e.g., adding $6 + 7$ by creating the known equivalent $6 + 6 + 1 = 12 + 1 = 13$).			L3/A5, L3/A6
<i>Work with addition and subtraction equations</i>			
1.OA.7. Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false. For example, which of the following equations are true and which are false? $6 = 6$, $7 = 8 - 1$, $5 + 2 = 2 + 5$, $4 + 1 = 5 + 2$.			L3/A5, L3/A6

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<p>1.OA.8. Determine the unknown whole number in an addition or subtraction equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations $8 + ? = 11$, $5 = _ - 3$, $6 + 6 = _$.</p>			
Second Grade Mathematics Standards: Operations and Algebraic Thinking			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Represent and solve problems involving addition and subtraction			
<p>2.OA.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.</p>			
	<p>EE2.OA.1. Add and subtract to solve real world one-step story problems from 0-20 when the result is unknown.</p>	<p>Level IV AA Students will: EE2.OA.1. Add and subtract to solve real world one-step story problems from 0-20 when any number in the problem is unknown (result, start, change, difference).</p>	<p>L3/A5, L3/A6 L3/S3</p>
Add and subtract within 20			
<p>2.OA.2. Fluently add and subtract within 20 using mental strategies.⁵ By end of Grade 2, know from memory all sums of two one-digit numbers.</p>			
Work with equal groups of objects to gain foundations for multiplication			
<p>2.OA.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.</p>			
	<p>EE2.OA.3. Equally distribute even numbers of objects between two groups.</p>	<p>Level IV AA Students will: EE2.OA.3. Determine that a quantity of objects is even or odd by separating them into two groups. that if there are leftovers, the quantity is odd and if the quantity divides evenly, the number is even.</p>	<p>L2/A2, L3/E4</p>
<p>2.OA.4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.</p>			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE2.OA.4. Use addition to find the total number of objects arranged within equal groups up to a total of 10.	Level IV AA Students will: EE2.OA.4. Use addition to find the total number of objects arranged within equal groups beyond 10.	L3/A5, L3/S3
Third Grade Mathematics Standards: Operations and Algebraic Thinking			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Represent and solve problems involving addition and subtraction			
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 . 3.OA.2. Interpret whole- number quotients of whole numbers, e.g., interpret $56 \div 8$ 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 $56 \div 8$.			
	EE3.OA.1-2. Use repeated addition and equal groups to find the total number of objects to find the sum.	Level IV AA Students will: EE3.OA.1-2. Use repeated addition to find the total number of objects arranged in a square or rectangular array.	L3/A5, L2/A2 L3/S3
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.			
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 $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$			
	EE3.OA.4. Solve addition and subtraction problems when result is unknown with number 0-30.	Level IV AA Students will: EE3.OA.4. Solve addition and subtraction problems when any number in the problem is unknown (result, start, change, difference) with numbers to 50	L3/A5, L3/A6 L3/S3

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Understand properties of multiplication and the relationship between multiplication and division</i>			
<p>3.OA.5. Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$, then $15 \times 2 = 30$, or by $5 \times 2 = 10$, then $3 \times 10 = 30$. (Associative property of multiplication.) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$, one can find 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)</p>			
<p>3.OA.6. Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.</p>			
<i>Multiply and divide within 100</i>			
<p>3.OA.7. Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.</p>			
<i>Solve problems involving the four operations and identify and explain patterns in arithmetic</i>			
<p>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.</p>			L3/A5, L3/S3
<p>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.</p>			
	<p>EE3.OA.9. Identify arithmetic patterns.</p>	<p>Level II AA Students will: EE3.OA.9. Identify a pattern.</p>	L3/S3, L3/E3

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Fourth Grade Mathematics Standards: Operations and Algebraic Thinking			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Use the four operations with whole numbers to solve problems			
<p>4.OA.1. Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ 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.</p> <p>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.</p>			
	EE4.OA.1-2. Demonstrate the connection between repeated addition and multiplication.	<p>Level II AA Students will:</p> <p>EE4.OA.1-2. Demonstrate repeated addition to sums of 10.</p>	L3/A5
<p>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.</p>			
	EE4.OA.3. Solve one-step word problems using addition or subtraction.	<p>Level IV AA Students will:</p> <p>EE4.OA.3. Solve two-step problems using addition or subtraction when a number in the problem is unknown (result, start, change, difference).</p>	L3/A5, L3/S3
Gain familiarity with factors and multiples			
<p>4.OA.4. Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.</p>			
	EE4.OA.4. Show one way to arrive at product.	<p>Level II AA Students will:</p> <p>EE4.OA.4. Make equal sets and count to determine the product.</p>	L2/A5, L3/S3

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<i>Generate and analyze patterns</i>			
<p>4.OA.5. Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.</p>			
	<p>EE4.OA.5. Use repeating patterns to make predictions.</p>	<p>Level I AA Students will: EE4.OA.5. Differentiate between a pattern and a non-pattern.</p>	<p>L3/E4, L3/E3</p>

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Kindergarten Mathematics Standards: Number and Operations in Base Ten			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Work with numbers 11-19 to gain foundations for place value			
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 (such as $18 = 10 + 8$); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.			L3/A5, L3/A6, L3/A2 L3/A3, L2/A2
First Grade Mathematics Standards: Number and Operations in Base Ten			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Extend the counting sequence			
1.NBT.1. Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.			
	EE1.NBT.1.a. Count by ones.	Level IV AA Students will: EE1.NBT.1.a. Count from 1 - 30 with meaning; cardinality.	L3/A1
	EE1.NBT.1.b. Count as many as 10 objects and represent the quantity with the corresponding numeral.	Level IV AA Students will: EE1.NBT.1.b. Count up to 20 objects and represent the quantity with a numeral.	L2/A6
Understand place value			
1.NBT.2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: 10 can be thought of as a bundle of ten ones — called a “ten.” The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).			
	EE1.NBT.2. Create sets of 10	Level IV AA Students will: EE1.NBT.2. Create multiple sets of ten with an odd number of objects (remainders).	L2/A5, L3/A4
1.NBT.3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols $>$, $=$, and $<$.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE1.NBT.3. Compare two groups of 10 or fewer items when the quantity of items in each group is similar.	Level III AA Students will: EE1.NBT.3. Compare two groups of 10 or fewer items when the quantity of items in each group is similar.	L3/A3, L3/S3
<i>Use place value understanding and properties of operations to add and subtract</i>			
1.NBT.4. Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten.			
	EE1.NBT.4. Compose numbers less than or equal to five in more than one way.	Level IV AA Students will: EE1.NBT.4. Compose numbers less than or equal to 10 in more than one way.	L2/A5
1.NBT.5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.			
1.NBT.6. Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.			
	EE1.NBT.6. Decompose numbers less than or equal to five in more than one way.	Level IV AA Students will: EE1.NBT.6. Decompose numbers less than or equal to 10 in more than one way.	L2/A5

Second Grade Mathematics Standards: Number and Operations in Base Ten

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Understand place value			
2.NBT.1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: • 100 can be thought of as a bundle of ten tens — called a “hundred.” • The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).			
	EE2.NBT.1. Represent numbers through 30 with sets of tens and ones with objects in columns or arrays.	Level III AA Students will: EE2.NBT.1. Represent numbers through 30 with sets of tens and ones with objects in columns or arrays.	L2/A5
2.NBT.2. Count within 1000; skip-count by 5s,			
	EE2.NBT.2.a. Count from 1 to 30 (count with meaning; cardinality).	Level III AA Students will: EE2.NBT.2.a. Count from 1 to 30 (count with meaning; cardinality).	L3/A1, L2/A2
	EE2.NBT.2.b. Name the next number in a sequence between 1 and 10.	Level IV AA Students will: EE2.NBT.2.b. Count forward beginning from a given number within the known sequence 2 to 10 (instead of having to begin at one).	L2/A1
2.NBT.3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.			
	EE2.NBT.3. Identify number symbols 1 to 30.	Level IV AA Students will: EE2.NBT.3. Express number symbols beyond 30.	L3/A3
2.NBT.4. Compare two, three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.			
	EE2.NBT.4. Compare sets of objects and numbers using appropriate vocabulary (more, less, equal).	Level IV AA Students will: EE2.NBT.4. Compare sets of objects and numbers using appropriate vocabulary as equal or more or less when two or fewer units apart.	L2/A6
Use place value understanding and properties of operations to add and subtract			
2.NBT.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.			
	EE2.NBT.5.a. Identify the meaning of the “+” sign (i.e., combine, plus, add), and the “=” sign (equal).	Level IV AA Students will: EE2.NBT.5.a. Identify the meaning of the “+” sign (i.e., combine, plus, add), the “=” sign (equal), and the “-” sign (minus, take away, less).	L3/A5, L3/A6

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE2.NBT.5.b. Using concrete examples, compose and decompose numbers up to 10 in more than one way	Level IV AA Students will: EE2.NBT.5.b. Using numbers or representations, compose and decompose numbers up to 10 in more than one way.	L2/A5
2.NBT.6. Add up to four two-digit numbers using strategies based on place value and properties of operations. 2.NBT.7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.			
	EE2.NBT.6-7. Use objects, representations, and numbers (0-20) to add and subtract.	Level IV AA Students will: EE2.NBT.6-7. Use objects, representations, and numbers beyond 20 to add and subtract.	L3/A5, L3/A6
2.NBT.8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.			
2.NBT.9. Explain why addition and subtraction strategies work, using place value and the properties of operations. ⁶			
Third Grade Mathematics Standards: Number and Operations in Base Ten			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Use place value understanding and properties of operations to perform multi-digit arithmetic			
3.NBT.1. Use place value understanding to round whole numbers to the nearest 10 or 100.			
	EE3.NBT.1. Identify the two 10s a number comes in between on a number line (numbers 0-30).	Level IV AA Students will: EE3.NBT.1. Identify the two 10s a number comes in between and tell which is closest (numbers 0-50).	L3/A4
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.			
	EE3.NBT.2. Identify place value to tens.	Level II AA Students will: EE3.NBT.2. Count to 10 using one-to-one correspondence.	L2/A2

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
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.	EE3.NBT.3. Count by tens using money.	Level IV AA Students will: EE3.NBT.3. Compare the value of money based on place value.	L3/A7
Fourth Grade Mathematics Standards: Number and Operations in Base Ten			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Generalize place value understanding for multi-digit whole numbers			
4.NBT.1. Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that $700 \div 70 = 10$ by applying concepts of place value and division.	EE4.NBT.1. Compare numbers to each other based on place value groups by composing and decomposing to 50.	Level II AA Students will: EE4.NBT.1. Compose and decompose whole numbers to 20.	L3/A4
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.	EE4.NBT.2. Compare whole numbers ($<$, $>$, $=$).	Level II AA Students will: EE4.NBT.2. Compare whole numbers ($<$, $>$, $=$) from 0-20.	L3/E3, L3/S3
4.NBT.3. Use place value understanding to round multi-digit whole numbers to any place.	EE4.NBT.3. Round one- and two-digit whole numbers from 0—50 to the nearest 10	Level III AA Students will: EE4.NBT.3. Round single one- and two-digit whole numbers from 0-50 to the nearest 10.	L3/A4, L3/A7
Use place value understanding and properties of operations to perform multi-digit arithmetic			
4.NBT.4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.	EE4.NBT.4. Add and subtract double-digit whole numbers.	Level I AA Students will: EE4.NBT.4. Solve single digit addition problems to add one to another number.	L3/A5

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<p>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.</p> <p>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.</p>			
<p>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.</p> <p>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.</p>			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Kindergarten Mathematics Standards: Measurement and Data			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Describe and compare measurable attributes</i>			
K.MD.1. Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.			L3/E3, L3/S2
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.			
		Level IV AA Students will: EEK.MD.1-3. Order objects according to attributes (big/smaller/smallest, heavy/lighter/lightest).	L3/E3, L3/S2
<i>Classify objects and count the number of objects in each category</i>			
K.MD.3. Classify objects into given categories; count the numbers of objects in each category and sort the categories by count. ²			
		Level III AA Students will: EEK.MD.1-3. Classify objects according to attributes (big/small, heavy/light).	L2/R7
First Grade Mathematics Standards: Measurement and Data			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Measure lengths indirectly and by iterating length units</i>			
1.MD.1. Order three objects by length; compare the lengths of two objects indirectly by using a third object. 1.MD.2. Express the length of an object as a whole number of length units, by laying multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps. Limit to contexts where the object being measured is spanned by a whole number of length units with no gaps or overlaps.			
	EE1.MD.1-2. Use appropriate vocabulary to describe the length of an object using the language of longer/shorter, taller/shorter.	Level IV AA Students will: EE1.MD.1-2. Measure and compare two similar objects aligned at the same starting point, and describe which is longer/shorter, taller/shorter.	L3/E3, L3/S2

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Tell and write time			
1.MD.3. Tell and write time in hours and half-hours using analog and digital clocks.			L3/A8
	EE1.MD.3.b. Name a day of the week for tomorrow and yesterday.	Level IV AA Students will: EE1.MD.3.b. Using a calendar, recall the seven days of the week and identify the appropriate day for tomorrow and yesterday.	L3/F5, L3/E12
	EE1.MD.3.c. Identify activities that come next, before, and after.	Level IV AA Students will: EE1.MD.3.c. Correctly sequence the activities given the direction to identify what comes next, before, and after in the day's or week's schedule.	L3/E14, L3/R7
	EE1.MD.3.d. Demonstrate an understanding that telling time is the same every day.	Level IV AA Students will: EE1.MD.3.d. Demonstrate an understanding of telling time with a clock or watch related to real-life context.	L3/A8
Represent and interpret data			
1.MD.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.			L2/R7, L2/A2
Second Grade Mathematics Standards: Measurement and Data			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Measure and estimate lengths and standard units			
2.MD.1. Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.			
2.MD.2. Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.			
	EE2.MD.1. Measure the length of objects using non-standard units.	Level I AA Students will: EE2.MD.1. Match objects of like length.	L1/R7
2.MD.3. Estimate lengths using units of inches, feet, centimeters, and meters.			
2.MD.4. Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE2.MD.3-4. Order by length using non-standard units.	Level I AA Students will: EE2.MD.3-4. Compare an item to a model that is shorter or longer.	L3/E3
Relate addition and subtraction to length			
2.MD.5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.			
	EE2.MD.5. Increase or decrease length by adding or subtracting unit(s).	Level II AA Students will: EE2.MD.5. Increase length by adding a single unit.	L3/A4, L3A5
2.MD.6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, . . . , and represent whole-number sums and differences within 100 on a number line diagram.			
	EE2.MD.6. Use a number line to add one more unit of length.	Level II AA Students will: EE2.MD.6. Count forward on a number line to 10 showing units of length.	L2/A1, L2/A2 L2/A3, L2/A4
Work with time and money			
2.MD.7. Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.			
	EE2.MD.7. Indicate the digit that tells the hour on a digital clock.	Level IV AA Students will: EE2.MD.7. Tell time to the hour on a digital and analog clock.	L3/A8
2.MD.8. Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using \$ and ¢ symbols appropriately. Example: If you have 2 dimes and 3 pennies, how many cents do you have?			
	EE2.MD.8. Recognize that money has value.	Level IV AA Students will: EE2.MD.8. Recognize that money is used in exchange for goods.	L3/A7

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Represent and interpret data			
<p>2.MD.9. Generate measurement data by measuring lengths of several objects to the nearest whole unit, or by making repeated measurements of the same object. Show the measurements by making a line plot, where the horizontal scale is marked off in whole-number units.</p> <p>2.MD.10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart and compare problems using information presented in a bar graph.</p>			
	EE2.MD.9-10. Create picture graphs from collected measurement data.	<p>Level I AA Students will:</p> <p>EE2.MD.9-10. Contribute to data collection.</p>	L2/R7, L2/R1
Third Grade Mathematics Standards: Measurement and Data			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects			
<p>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.</p>			
	EE3.MD.1. Tell time to the hour on a digital clock.	<p>Level IV AA Students will:</p> <p>EE3.MD.1. Tell time to the half hour using a digital clock.</p>	L3/A8
<p>3.MD.2. Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l).¹² 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.¹³</p>			
	EE3.MD.2. Identify standard units of measure for mass and liquid.	<p>Level II AA Students will:</p> <p>EE3.MD.2. Select the appropriate tool to measure a solid or a liquid.</p>	L2/R2

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Represent and interpret data			
<p>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</p>			
	<p>EE3.MD.3. Use picture or bar graph data to answer questions about data.</p>	<p>Level I AA Students will: EE3.MD.3. Collect data.</p>	L2/R7, L2/R2
<p>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.</p>			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Geometric measurement: understand concepts of area and relate to multiplication and to addition</i>			
<p>3.MD.5. Recognize area as an attribute of plane figures and understand concepts of area measurement.</p> <ul style="list-style-type: none"> • A square with side length of 1 unit, called “a unit square,” is said to have “one square unit” of area, and can be used to measure area. • A plane figure, which can be covered without gaps or overlaps by n unit squares, is said to have an area of n square units. <p>3.MD.6. Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).</p> <p>3.MD.7. Relate area to the operations of multiplication and addition. Find the area of a rectangle with whole- number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole- number products as rectangular areas in mathematical reasoning. the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. applying this technique to solve real world problems. Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</p>			
<p>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.</p>			

Fourth Grade Mathematics Standards: Measurement and Data			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects			
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), ...			
	EE4.MD.1. Identify the smaller measurement units that divide a larger unit within a measurement system.	Level I AA Students will: EE4.MD.1. Use measurement tools.	L3/E3
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.			
	EE4.MD.2.a. Tell time to the half hour using a digital or to the hour using an analog clock.	Level III AA Students will: EE4.MD.2.a. Tell time to the half hour using a digital clock or to the hour using an analog clock.	L3/A8
	EE4.MD.2.b. Select the appropriate measurement tool from two related options to solve problems.	Level I AA Students will: EE4.MD.2.b. Identify measurement tools.	L2/R2
	EE4.MD.2.c. Use standard measurement to compare lengths of objects.	Level I AA Students will: EE4.MD.2.c. Identify items as long or short.	L3/R3, L3/E3
	EE4.MD.2.d. Identify objects that have volume.	Level I AA Students will: EE4.MD.2.d. Identify vocabulary related to volume (full, empty).	L3/R3, L3/E3
	EE4.MD.2.e. Identify coins (penny, nickel, dime, quarter) and their values.	Level III AA Students will: EE4.MD.2.e. Identify coins (penny, nickel, dime, quarter) and their values.	L3/A7
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.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Represent and interpret data			
4.MD.4. Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). 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.			
	EE4.MD.4.b. Interpret data from a variety of graphs to answer questions.	Level I AA Students will: EE4.MD.4.b. Demonstrate awareness that symbols may be used to represent objects and events.	L3/A12, L2/E3 L3/E1
Geometric measurement: understand concepts of angle and measure angles			
4.MD.5. Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: • 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 $\frac{1}{360}$ of a circle is called a "one-degree angle," and can be used to measure angles. • An angle that turns through n one-degree angles is said to have an angle measure of n degrees.			
	EE4.MD.5. Recognize angles in geometric shapes.	Level III AA Students will: EE4.MD.5. Recognize angles in geometric shapes. shape on a whiteboard.	L2/R1, L2/E2
4.MD.6. Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.			
	EE4.MD.6. Identify angles as larger and smaller.	Level I AA Students will: EE4.MD.6. Replicate an angle.	L3/A17
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.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Kindergarten Mathematics Standards: Geometry			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)			
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.			L2/R1, L2/E2 L3/E2
K.G.2. Correctly name shapes regardless of their orientations or overall size.			L2/E2 (K.G.2)
K.G.3. Identify shapes as two-dimensional (lying in a plane, "flat"; or three-dimensional, "solid").			
	EEK.G.2-3. Match two-dimensional shapes (circle, square, triangle).	Level IV AA Students will: EEK.G.2-3. Match two-dimensional shapes that vary in size (circle, square, triangle).	L1/A3 (K.G.3-Level IV)
First Grade Mathematics Standards: Geometry			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Reason with shapes and their attributes			
1.G.1. Distinguish between defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (e.g., color, orientation, overall size); build and draw shapes to possess defining attributes.			L2/E1, L3/A17 (1.G.1)
1.G.2. Compose two-dimensional shapes (rectangles, squares, trapezoids, triangles, half-circles, and quarter-circles) or three-dimensional shapes (cubes, right rectangular prisms, right circular cones, and right circular cylinders) to create a composite shape, and compose new shapes from the composite shape.			
	EE1.G.1. Identify common two-dimensional shapes: square, circle, triangle, and rectangle.	Level IV AA Students will: EE1.G.1-2. Identify attributes of common two-dimensional shapes: square, circle, triangle, and rectangle.	L2/E1, L2/R7 L2/A2 (1.G.2-Level IV)
1.G.3. Partition circles and rectangles into two and four equal shares, describe the shares using the words halves, fourths, and quarters, and use the phrases half of, fourth of, and quarter of. Describe the whole as two of, or four of the shares. Understand for these examples that decomposing into more equal shares creates smaller shares.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE1.G.3. Put together two pieces to make a shape that relates to the whole (i.e., two semicircles to make a circle, two squares to make a rectangle).	Level III AA Students will: EE1.G.3. Put together two pieces to make a shape that relates to the whole (i.e., two semicircles to make a circle, two squares to make a rectangle).	L2/R1, L3/A17
Second Grade Mathematics Standards: Geometry			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Reason with shapes and their attributes			
2.G.1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.7 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.2.G.1. Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces.7 Identify triangles, quadrilaterals, pentagons, hexagons, and cubes.			
	EE2.G.1. Describe attributes of two-dimensional shapes.EE2.G.1. Describe attributes of two- dimensional shapes.	Level III AA Students will: EE2.G.1. Describe attributes of two-dimensional shapes.	L2/R1, L2/E2 L3/A17
2.G.2. Partition a rectangle into rows and columns of same-size squares and count to find the total number of them.			
2.G.3. Partition circles and rectangles into two, three, or four equal shares, describe the shares using the words halves, thirds, half of, a third of, etc., and describe the whole as two halves, three thirds, four fourths. Recognize that equal shares of identical wholes need not have the same shape.			
Third Grade Mathematics Standards: Geometry			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Reason with shapes and their attributes			
3.G.1. Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
	EE3.G.1. Recognize that shapes in different categories can share attributes.	Level III AA Students will: EE3.G.1. Recognize that shapes in different categories can share attributes.	L2/E2, L3/E3 L3/E4
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.			
	EE3.G.2. Recognize that shapes can be partitioned into equal areas.	Level II AA Students will: EE3.G.2. Create shapes.	L2/R1, L3/R3 L3/A17
Fourth Grade Mathematics Standards: Geometry			
Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Draw and identify lines and angles and classify shapes by properties of their lines and angles</i>			
4.G.1. Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.			
	EE4.G.1. Distinguish between parallel and intersecting lines.	Level I AA Students will: EE4.G.1. Identify a line.	L3/A17
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.			
	EE4.G.2. Distinguish between different attributes of shapes (lines, curves, angles).	Level III AA Students will: EE4.G.2. Distinguish between different attributes of shapes (lines, curves, angles).	L2/R1, L2/R7 L3/A17
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.			
	EE4.G.3. Recognize a line of symmetry in a simple shape.	Level II AA Students will: EE4.G.3. Recognize polygons.	L1/A3, L2/E3

Third Grade Mathematics Standards: Number and Operations--Fractions

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<i>Develop understanding of fractions as numbers.</i>			
<p>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 $1/b$.</p> <p>3.NF.2. Understand a fraction as a number on the number line; represent fractions on a number line diagram.</p> <ul style="list-style-type: none"> • 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. <p>3.NF.3. Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. 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. $= 3/1$; recognize that $6/1 = 6$; locate $4/4$ and 1 at the same point of a number line diagram. symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.</p>			
	<p>EE3.NF.1-3. Differentiate a fractional part from a whole.</p>	<p>Level III AA Students will: EE3.NF.1-3. Differentiate a fractional part from a whole.</p>	<p>L2/R7</p>

Fourth Grade Mathematics Standards: Number and Operations--Fractions

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
Extend understanding of fraction equivalence and ordering			
<p>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.</p> <p>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.</p>			
	<p>EE4.NF.1-2. Understand $2/4 = 1/2$.</p>	<p>Level II AA Students will: EE4.NF.1-2. Understand $4/4$ or $2/2 = 1$.</p>	<p>L2/F8</p>
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers			
<p>4.NF.3. Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.</p> <ul style="list-style-type: none"> • Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. • Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8$ • Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. • Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. 			
	<p>EE4.NF.3. Differentiate between whole, half, and fourth.</p>	<p>Level II AA Students will: EE4.NF.3. Differentiate between whole and half.</p>	<p>L3/F7, L3/F16</p>

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<p>4.NF.4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.</p> <ul style="list-style-type: none"> • 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 $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$. • Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In • 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>Understand decimal notation for fractions, and compare decimal fractions</i>			
<p>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. For example, express $3/10$ as $30/100$, and add $3/10 + 4/100 = 34/100$.</p>			
<p>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.</p>			
<p>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.</p>			
<p>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.</p>			

Relationship Between the Common Core Essential Elements and STAR Lessons and Routines

Common Core State Standards Grade Level Standards	Common Core Essential Elements	Instructional Achievement Level Descriptors	Relevant STAR Lessons
<p>5.NF.7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.16 example, create a story class=Section170> context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$. fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$. 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?</p>			

References

ELA:

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). Common Core State Standards for English language arts and literacy in history/social studies, science, and technical subjects. Washington, DC: Authors.

Math:

National Governors Association Center for Best Practices & Council of Chief State School Officers. (2010). Common Core State Standards for Mathematics. Washington, DC: Authors.