Board of Education
Community Consolidated School District 64

Committee-of-the-Whole: Recommendations from Math Curriculum Review Committee on Curriculum Materials

Monday, March 18, 2013
7:00 p.m. – 7:30 p.m.

Lincoln Middle School School - Gym
200 South Lincoln

AGENDA

1. CALL TO ORDER AND ROLL CALL

2. RECOMMENDATIONS FROM MATH CURRICULUM REVIEW COMMITTEE ON CURRICULUM MATERIALS

3. PUBLIC COMMENTS

4. ADJOURNMENT

To: District 64 Board of Education
Dr. Philip Bender, Superintendent

From: Dr. Lori Hinton, Assistant Superintendent for Student Learning
Tracie Thomas, K-5 Math Curriculum Specialist
Christine Thielen, Middle School Math Department Chairperson

Date: March 18, 2013

Re: Math Curriculum Review and Recommendations for Curriculum Adoption

OVERVIEW

This report shares three key recommendations from the Math Curriculum Review Committee for supporting District 64's implementation of the Common Core State Standards for Mathematics (CCSSM). The three recommendations are related to materials adoption, professional development, and the District 64 Math Priority Standards. While the materials recommended for adoption will provide teachers with a critical resource for supporting student learning, they are only one tool for addressing the rigor of the CCSSM. Professional development will also play an essential role in shifting instructional practice.

Committee Goals

The goal of the Math Curriculum Review Committee is to support the delivery of high quality math instruction aligned with the Common Core State Standards in Mathematics (CCSSM) to all District 64 students. This year, the committee has convened to: 1) Identify curriculum materials for potential adoption, 2) Approve recommendations for small refinements to the District 64 Math Priority Standards, and 3) Review and recommend math assessments and progress-monitoring tools.

As described in the February 25 report to the Board on District-wide Priorities & Strategic Plan Activities, the Math Curriculum Review Committee is rooted in the District 64 Strategic Plan process (Strategy IV Student Learning). Members were part of the larger strategic planning committee responsible for unpacking the CCSSM and identifying priority standards at each grade level. The goal of the CCSS Initiative is to develop a common core of state standards in English Language Arts and Mathematics for grades K-12. These standards are designed to ensure that students graduating from high school are career and college-ready and that parents, teachers, and students have a clear understanding of what is expected of them.

There are several key ideas within the progression of the K-12 CCSSM:

> "The K-5 Math Standards provide students with a *solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals*—which help young students build the foundation to successfully apply more demanding math concepts and procedures, and move into applications.

In kindergarten, the standards follow successful international models and recommendations from the National Research Council's Early Math Panel report, by focusing kindergarten work on the number core: learning how numbers correspond to quantities, and learning how to put numbers together and take them apart (the beginnings of addition and subtraction).

The K-5 standards build on the best state standards to provide detailed guidance to teachers on how to navigate their way through knotty topics such as *fractions, negative numbers, and geometry*, and do so by maintaining a continuous progression from grade to grade. The standards stress not only procedural skill but also conceptual understanding, to make sure students are learning and absorbing the critical information they need to succeed at higher levels - rather than the current practices by which many students learn enough to get by on the next test, but forget it shortly thereafter, only to review again the following year.

Having built a strong foundation K-5, students can do hands on learning in geometry, algebra and probability and statistics. Students who have completed 7th grade and mastered the content and skills through the 7th grade will be *well-prepared for algebra* in grade 8. The middle school standards are robust and provide a coherent and rich *preparation for high school mathematics*.

The high school standards call on students to *practice applying mathematical ways of thinking to real world issues and challenges*; they prepare students to think and reason mathematically. The high school standards set a *rigorous definition of college and career readiness*, by helping students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do. The high school standards *emphasize mathematical modeling*, the use of mathematics and statistics to analyze empirical situations, understand them better, and improve decisions." (Source: www.corestandards.org/resources/key-points-in-mathematics)

In addition to content standards, the CCSSM include eight Standards for Mathematical Practice, which describe mathematics expertise that we expect all District 64 students to achieve. These practices rest on important "processes and proficiencies" including: problem solving, reasoning abstractly and quantitatively, communicating and critiquing, modeling using tools strategically, attending to precision, discerning patterns or structure, and looking for regularity in repeated reasoning (see http://www.corestandards.org/Math/Practice for additional information about the Standards for Mathematical Practice).

We anticipate three shifts in instruction to support student mastery of the new content standards and the Standards for Mathematical Practice:

1. **Focus:** The CCSS focus on fewer topics at each grade level and address them in greater depth. Instruction will focus deeply on only those concepts that are emphasized in the standards.

2. **Coherence:** Instruction will encourage students to think across grades and link to major topics within grades. In other words, each standard will not be viewed as a new event, but as an extension of previous learning.
3. **Rigor:** The CCSSM emphasize that all three aspects of mathematics knowledge are critical to the discipline. That is, students will be required to demonstrate deep conceptual understanding, procedural skill and fluency, and application to solve problems.

The Math Curriculum Review Committee worked diligently to assess the effectiveness of all instructional materials in supporting student mastery of the CCSSM content standards and the Standards for Mathematical Practice.

Committee Membership

The District Math Curriculum Review Committee is comprised of grade-level representatives from each school in the District in addition to representatives from the Instructional Technology Coach Team, Instructional Resource, Channels of Challenge, and the Principal Team.

Elementary School members include: Lynne Bugai - K, Patti Malartsik - K/1, Erin Breen - 1, Julie Chalberg - 1, Jenny DeLuca - 1, Melanie Moon - 2, Nancy Sweeney - 2, Carolyn Borta - 3, Dawn O'Connor - 4, Sandy Blethen - 4, Matt Bozeday - 4/5, Lindsey Hejza - 5, Carrie Bellen - Instructional Technology Coach, Mary McCabe - Instructional Resource, Kitty McGrath - Instructional Resource, Tina DeCicco - Primary Challenge, Kelly Tess - Assistant Principal, and Martha Rode - Instructional Resource Facilitator.

Middle School members include: Josh Hammond - 6, Tricia Warneke - 6, Erica Dieden - 7/8, Mark Pancini - 7/8, Michele Vondruska - 7/8, Linda Damianides - Channels of Challenge, Shirlee Pater - Channels of Challenge, Kelly McCall - Instructional Resource, Jim Morrison - Principal, and Christine Thielen - Math Department Chairperson.

In addition, three staff members served on both the elementary and middle school teams: Tracie Thomas, K-5 Math Curriculum Specialist, Camille Derwin - Instructional Resource Facilitator/Channels of Challenge Curriculum Specialist, Dr. Lori Hinton - Assistant Superintendent for Student Learning, and Kristen Clegg - Math Education Consultant.

THE CURRICULUM ANALYSIS PROCESS

Curriculum analysis is a rigorous process that involves multiple stages including professional development, the use of curriculum analysis tools, and lesson/unit sampling.

The Math Curriculum Review Committee members began our work together with an in-depth review of the CCSSM. Professional development was led by Kristen Clegg, an educational consultant with Dynamic Math Institute, and focused on the CCSSM content standards at each grade level, the Standards for Mathematical Practice, and the tools for curriculum evaluation.

The Math Curriculum Review Committee then implemented a comprehensive process

to review the alignment of potential math curriculum materials to the CCSSM. Three alignment tools developed by the CCSS Mathematics Curriculum Analysis Project assisted the committee with evaluating mathematics curriculum materials that support implementation of the CCSSM. The CCSS Mathematics Curriculum Analysis Project is led by a national team of educators with expertise in mathematics, mathematics education, and school administration. The tools are designed to provide educators with objective measures and information to guide their selection of mathematics curriculum materials based on evidence of the materials' alignment with the CCSSM.

Each tool contributes different information to the curriculum analysis process:

- **Tool 1** provides information about the degree to which specific topics are incorporated appropriately at each grade level. (Attachment 1)
- **Tool 2** focuses on the extent to which the Standards for Mathematical Practice are embedded and integrated in the curriculum materials. (Attachment 2)
- **Tool 3** focuses on the extent to which mathematics curriculum materials address considerations related to equity, assessment, materials, and technology. (Attachment 3)

The tools were first used to evaluate District 64's current mathematics programs. **After careful review, the committee concluded that significant gaps in the alignment of the CCSSM content standards and the Standards for Mathematical Practice exist within our current series.**

The analysis process continued with a publisher's overview and careful review of current published math programs. At the elementary level, this included six different curricular programs: My Math by McGraw-Hill, Go Math by Houghton Mifflin, Envision Math by Pearson, Everyday Math by McGraw-Hill, Math in Focus (Singapore Math) by Houghton Mifflin, and Investigations by Pearson. At the middle school level, this included five different curricular programs: Glencoe Math by McGraw-Hill, Big Ideas by Houghton Mifflin, Digits by Pearson, Prentice Hall 3 by Pearson, and Math in Focus (Singapore Math) by Houghton Mifflin.

Following these presentations, all committee members spent many hours analyzing the different textbook series using Tool 1 and Tool 2. The tools enabled us to objectively evaluate the series' alignment to the CCSSM content standards and the series' focus on the Standards for Mathematical Practice.

After carefully utilizing Tool 1 and Tool 2, the elementary school members found that each program had varying strengths and deficits. Generally, elementary school members found that the following series did not fully address the CCSSM content standards and/or the Standards for Mathematical Practice: Envision Math by Pearson, Investigations by Pearson, Everyday Math by McGraw Hill, and Math in Focus (Singapore Math) by Houghton Mifflin. Two series remained for further analysis and consideration: My Math by McGraw-Hill and Go Math by Houghton Mifflin.

After carefully utilizing Tool 1 and Tool 2, the middle school members also found that each program had varying strengths and deficits. Generally, the middle school members found that the following series did not address fully the CCSSM content

standards and/or the Standards for Mathematical Practice: Digits by Pearson, Prentice Hall 3 by Pearson, and Math in Focus (Singapore Math) by Houghton Mifflin. Two series remained for further analysis and consideration: Glencoe Math by McGraw-Hill and Big Ideas by Houghton Mifflin.

To seek further information about each of these programs, professional development staff from McGraw-Hill and Houghton Mifflin were invited to share additional information with the committee. The committee then used Tool 3 to analyze the extent to which each series addresses considerations related to equity, assessment, materials, and technology.

Because of the availability of the three tools, a large-scale "pilot" of a series was not necessary. However, strategic lesson and unit sampling was conducted. This enabled committee members to gather additional information about implementation and student engagement. Middle school committee members also conducted site visits to observe the implementation of each of the programs. The information gathered during the curriculum analysis process enabled committee members to achieve consensus around recommendations for adoption.

COMMITTEE RECOMMENDATIONS

The Math Curriculum Review Committee is making three key recommendations related to materials adoption, professional development, and the District 64 Math Priority Standards.

RECOMMENDATION 1: Adopt the My Math series at grades K-5 and the Glencoe Math series at grades 6-8 for Course 1, Course 2, Course 3, Accelerated Pre-Algebra, Algebra I, and Algebra II (all published by McGraw-Hill).

Benefits

The Math Curriculum Review Committee found that the My Math and Glencoe series have the following features that will positively impact student learning:

- **Aligned to the CCSSM**
  Every lesson within both the elementary and middle school programs explicitly addresses the CCSSM. In addition, the elementary program includes a classroom library of nonfiction literature which addresses mathematical concepts in a the real-world setting. Incorporating nonfiction text is an essential instructional shift for the Common Core State Standards for English Language Arts.

- **Explicit Focus on the Standards for Mathematical Practice**
  The programs provide students with multiple experiences to build conceptual understanding. Activities are designed to engage students in mathematical modeling, reasoning, and reflection. Real-world problem solving activities are also integrated into lessons.

- **Differentiated Lessons to Support Enrichment and RtI**
  Each lesson includes recommendations for students performing at different instructional levels. This enables teachers to provide support for students who

are struggling as well as those who require an additional challenge. In addition, as described above, the elementary program includes a classroom library of nonfiction literature that addresses mathematical concepts in a real-world setting. Each text title is available at three different reading levels to differentiate instruction.

- **21st Century Technology**
  Online lesson planning enables teachers to design and save materials that incorporate Smartboard tools. Daily interactive Smartboard slides accompany each lesson. Assessments, classwork, and additional homework can be edited, assigned and completed online. Student reports can be generated to track performance, which assists in planning and supports communication of student growth with parents. Engaging videos are also available to introduce and reinforce concepts.

  Online student resources, referred to as the "eEdition," include virtual manipulatives, video tutorials, virtual tutors, an auditory glossary, online quizzes for self-monitoring, games to reinforce learning, and inquiry labs.

  Support tools are also available online to assist parents with understanding the concepts being explored at school.

- **Innovative Assessment Tools**
  These series give teachers the opportunity to electronically create and store assessments that truly reflect what their students are learning in class. Teachers can edit premade assessments, choose from question banks, or create their own questions. Assessments can be administered online or printed, and scores can be imported to the District's PowerSchool student database. Formative assessments, which can help drive teacher instruction, are embedded throughout the lessons. Assessment question options still allow for traditional short answer or multiple choice answers, but performance-based questions, reflecting higher-level learning, are another important component.

- **Consumable Guides**
  The recommended programs at both elementary and middle school (with the exception of Accelerated Pre-Algebra, Algebra I and Algebra II) include a consumable "guide" versus a traditional textbook. Students are able to solve problems and write reflective responses in these consumable guides. They are used in class for guided practice as well as at home for independent practice. The consumable guide, in concert with the eEdition online resources, provides students with comprehensive support for mastering their learning targets. The consumable guide is published each year enabling the industry to be responsive to current educational trends, feedback from educators, deepening understanding of the CCSS, and further development of the PARCC Assessment Framework.

Cost Analysis

The total cost for the K-8 program, excluding shipping, is $404,821.83. The total value of the program is $718,337. Shipping is estimated at approximately 5%, which would bring

the total cost to the District to $425,106.11. The value of free materials provided by the publisher is $313,515.17. The publisher has agreed to provide all teacher materials free of charge. In addition, all of the elementary real-world problem solving libraries will be provided free of charge. The District will be responsible for 46% percent of the manipulative kit cost which is $43,357.50. The remainder of the manipulative kits will be provided free of charge.

The total cost for the elementary program, excluding shipping, is: $280,313.40. This includes Course 1 and Course 2 materials for elementary Channels of Challenge students. This price represents a cost savings relative to our 2004 adoption. For historical comparison, the total elementary adoption cost in 2004 was $149,523.40. Each year following this adoption included an average purchase of $42,259 for consumable workbooks at the K-2 level. This brings the five-year adoption total for our 2004 program to an estimated $318,559.40. Our current adoption of $280,313.40 is an estimated $38,246 difference from our previous adoption. Because of digital resources, we expect future adoptions to follow this trend.

The total cost for the middle school program, excluding shipping, is: $124,508.43. This includes Course 1, Course 2, Course 3, Accelerated Pre-Algebra, Algebra I and Algebra II. Unfortunately, purchase orders for the previous middle school adoption are no longer available as this occurred in 2003. Based on estimates, the cost of the prior middle school adoption was approximately $29-$31 less per student due to the increased cost of printed texts. It is important to note that this previous adoption did not include access to the comprehensive eEdition online resource that is available today.

Online student resources have become a critical component of instruction and learning. Referred to as the "eEdition," online resources include virtual manipulatives, video tutorials, virtual tutors, an auditory glossary, online quizzes for self-monitoring, games to reinforce learning, and inquiry labs. McGraw-Hill offers "multiple year"packages which bundle the inexpensive consumable guide or print editions of the student text with the eEdition online resource.

Elementary K-5: My Math

McGraw-Hill offers a five-year package for the K-5 My Math program, which bundles a five-year subscription of the consumable guide and a five-year subscription of the eEdition online resource. The cost of this bundle is $78.99 per student. A one-year subscription to the online resource and the consumable guide is $16.98 per student. The five-year bundle reduces the cost per student to $15.80 per year and enables us to access current pricing for the next five years. It is recommended that the Board purchase this five-year bundle for $78.99 per student.

Middle School 6-8: Glencoe Math Course 1, Course 2, and Course 3

At the Middle School level, McGraw-Hill offers a bundled package that is similar to the elementary school package. For Courses 1, 2, and 3, McGraw-Hill offers a seven-year package which bundles the consumable guide with the eEdition online resource. The bundle costs $74.97 per student and includes a seven-year subscription to the eEdition online resource and a five-year subscription to the consumable guide. A one-year subscription to the online resource and the consumable guide is $16.98 per student. The seven-year bundle reduces the cost per student to $10.71 per year and enables us to

access current pricing for the next five years on the consumable guide and the next seven years on the online resource. It is recommended that the Board purchase this seven-year bundle for $74.97 per student.

Accelerated Pre-Algebra

McGraw-Hill offers a seven-year package for Accelerated Pre-Algebra, which bundles a print edition of the student text, a seven-year subscription to the eEdition online resource, and a five-year subscription to the consumable guide. The total cost of this bundle is $74.97. Purchased separately, the seven-year subscription to the eEdition online resources and a five-year subscription to the consumable guide would cost $107.60. This would not include a student text. It is recommended that the Board purchase this seven-year bundle for $74.97 per student.

Algebra I & Algebra II

The total cost of the Algebra I bundled package, $83.94, includes a six-year subscription to the eEdition online resource and a print edition of the student text. This series does not include a consumable guide. Purchased without the print edition of the student text, the six-year subscription to the eEdition online resource costs $63.48. The cost for the print edition of the student text without the eEdition online resource subscription is $78.99. It is recommended that the Board purchase this six-year bundle for $83.94 per student.

The total cost of the Algebra II bundled package, $87.93, includes a six-year subscription to the eEdition online resource and a print edition of the student text. This series does not include a consumable guide. Purchased without the print edition of the student text, the six-year subscription to the eEdition online resource costs $66.48. The cost for the print edition of the student text without the subscription to the eEdition online resource is $82.98. It is recommended that the Board purchase this six-year bundle for $87.93 per student.

At this time, it is not recommended that the District move to a solely digital text for Accelerated Pre-Algebra, Algebra I, and Algebra II. Based on our previous experiences with digital resources, we know that individual families face varying challenges with technology. As the Board Advanced Technology Committee prepares its final recommendations to the Board, it has made equitable access to technology a priority. For example, a 1:1 device scenario would fully support a digital text, creating seamless access to the resource between home and school. In addition, as students make the critical transition to the Common Core State Standards, it is recommended that each student have a print book. We anticipate that print editions of student texts will be phased out at the end of this math curriculum cycle.

The following chart summarizes this analysis:

Summary of Recommended Bundle Purchases

Bundle	Duration	Components	Price Per Student
K-5 My Math	5 years	• 5-year online resource subscription • 5-year consumable guide subscription	$78.99
6-8 Course 1, Course 2, & Course 3	5 years/ 7 years	• 7-year online resource subscription • 5-year consumable guide subscription	$74.97
Accelerated Pre-Algebra	5 years/ 7 years	• 7-year online resource subscription • 5-year consumable guide subscription • print edition of student text	$74.97
Algebra 1	6 years	• 6-year online resource subscription • print edition of student text	$83.94
Algebra 2	6 years	• 6-year online resource subscription • print edition of student text	$87.93

RECOMMENDATION 2: Provide ongoing professional development for both teachers and principals to support the three shifts in mathematics instruction.

The newly formed Math Grade-Level Professional Development Team consists of one teacher at each grade level from each K-5 school in addition to the Instructional Technology Coaches. This year, the team was responsible for presenting three math professional development modules for all teachers responsible for mathematics instruction. The modules were engaging, hands-on opportunities that provided teachers with a comprehensive explanation of the standards as well as instructional activities that support the standards. The Instructional Technology Coaches and Math Curriculum Specialist provide ongoing, job-embedded coaching for the implementation of these activities.

Through this professional development, each K-2 teacher explored three modules related to the CCSSM: 1) Operations and Algebraic Thinking, 2), Measurement and Data/Geometry, and 3) Number and Operations in Base Ten. Kindergarten teachers also explored Counting and Cardinality in Module 3. Each 3rd-5th grade teacher also explored three modules related to the CCSSM: 1) Operations and Algebraic Thinking, 2), Measurement and Data/Geometry, and 3) Number and Operations in Base Ten/ Number and Operations-Fractions. The three half-day modules were presented by the Grade-Level Professional Development Team at various times, including the November Institute Day, a Staff Development Wednesday, and during grade-level release times.

Because the three instructional shifts are critical to the mastery of the CCSSM content standards and the Standards for Mathematical Practice, ongoing professional development that builds on these foundational experiences is essential to the implementation of the CCSSM. The Department for Student Learning, Math Curriculum Specialist, Math Department Chairperson, and Math Curriculum Review Team will design a comprehensive professional development plan to support not only the implementation of the new resources but also the instructional shifts required to successfully implement the core standards.

While the adopted materials will provide teachers with a critical resource to support student learning, teachers need continued opportunities to design rigorous instructional activities. In addition to this professional development, representatives from grade-level teams will convene this summer to design additional learning experiences that support the CCSSM. Rich performance tasks will be identified from a number of resources including: National Council of Teachers of Mathematics, InsideMathematics.org, the PARCC Model Content Framework, illustrativemathematics.org, Center for Innovation and Education, The Van de Walle Professional Mathematics Series, and Exemplars.

RECOMMENDATION 3: Finalize the District 64 Math Priority Standards.

Earlier this year, Kristen Clegg, consultant with Dynamic Math Institute, collaborated with District 64's Math Curriculum Specialist and Middle School Department Chair to audit the Math Priority Standards. The goal of this year's audit was to check the K-8 learning progression of the Priority Standards identified by the Strategic Planning Committee in 2011-12. The Priority Standards were also compared to the PARCC Model Content Framework, which offers insight into the focus of this new assessment. The Math Curriculum Review Committee will review the results of this audit and refine the Priority Standards as needed.

NEXT STEPS

The Math Curriculum Review Committee seeks the Board's approval of these recommendations at its April 22, 2013 meeting. We would be happy to answer any questions from Board members related to these recommendations.

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials _____ **Publication Date** _____ **Grade Level(s)** _____

Content Coverage Rubric (Cont)
Not Found (N) - The mathematics content was not found.
Low (L) - Major gaps in the mathematics content were found.
Marginal (M) - Gaps in the content, as described in the Standards, were found and these gaps may not be easily filled.
Acceptable (A) - Few gaps in the content, as described in the Standards, were found and these gaps may be easily filled.
High (H) - The content was fully formed as described in the Standards.

Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
Not Found (N) - The content was not found.
Low (L) - The content was not developed or developed superficially.
Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.NBT/CC Counting and Cardinality/ Number and Operations in Base Ten	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**1.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**2.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Work with numbers 11-19 to gain foundations for place value				**Understand place value**				**Understand place value.**			
1. Compose and decompose numbers from 11 to 19 into ten ones and some further ones, e.g., by using objects or drawings, and record each composition or decomposition by a drawing or equation (e.g., 18 = 10 + 8); understand that these numbers are composed of ten ones and one, two, three, four, five, six, seven, eight, or nine ones.				2. Understand that the two digits of a two-digit number represent amounts of tens and ones. Understand the following as special cases: a. 10 can be thought of as a bundle of ten ones — called a "ten." b. The numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. c. The numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).				1. Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases: a. 100 can be thought of as a bundle of ten tens — called a "hundred." b. The numbers 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).			
Know number names and the count sequence				**Extend the counting sequence**				**Understand place value**			
1. Count to 100 by ones and tens 2. Count forward beginning from a given number within the known sequence. 3. Write number from 0 to 20. Represent a number of objects with a written numeral 0-20.				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.				2. Count within 1000; skip count by 5s, 10s,100s. 3. Read and write numbers to 1000 using base-ten numerals, number names, and expanded form.			

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2											
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**			
K.NBT/CC Counting and Cardinality/ Number and Operations in Base Ten	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**1.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**2.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Contt N-L-M-A-H**	**Bal N-L-M-A-H**
Work with numbers 11-19 to gain foundations for place value				**Understand place value**				**Understand place value.**			
4. Identify whether a number of objects is one group is greater than, less than, or equal to the number of objects in another group. 5. Compare two numbers between 1 and 10 presented as written numerals.				3. Compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and <.				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.			
Notes/Examples											

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials _____ **Publication Date** _____ **Grade Level(s)** _____

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Marginal (M) - The content was found and focused primarily on procedural skills and minimally on mathematical understanding, or ignored procedural skills.
Acceptable (A) -The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, but the connections between the two were not developed.
High (H) - The content was developed with a balance of mathematical understanding and procedural skills consistent with the Standards, and the connections between the two were developed.

CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.NBT Number and Operations in Base Ten	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**1.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**2.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Contt N-L-M-A-H**	**Bal N-L-M-A-H**
				Use place value understanding and properties of operations to add and subtract				**Use place value understanding and properties of operations to add and subtract**			
				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.				5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. 6. Add up to four two-digit numbers using strategies based on place value and properties of operations. 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.			

CCSSM Curriculum Analysis Tool 1—Number and Operations in Base Ten for Grades K-2												
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**				
				Use place value understanding and properties of operations to add and subtract				**Use place value understanding and properties of operations to add and subtract**				
				5. Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.				8. Mentally add 10 or 100 to a given number 100–900, and mentally subtract 10 or 100 from a given number 100–900.				
				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.				9. Explain why addition and subtraction strategies work, using place value and the properties of operations.				
Notes/Examples												

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades K-2

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials _____ **Publication Date** _____ **Grade Level(s)** _____

Content Coverage Rubric (Cont):
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Balance of Mathematical Understanding and Procedural Skills Rubric (Bal):
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CCSSM Grade K				CCSSM Grade 1				CCSSM Grade 2			
K.OA Operations and Algebraic Thinking	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**1.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**2.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Understand addition as putting together and adding to, and subtraction as taking apart and taking from				**Represent and solve problems involving addition and subtraction**				**Represent and solve problems involving addition and subtraction**			
2. Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.				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. *Common addition and subtraction situations. Adding To or Taking From situations with result unknown, change unknown, and start unknown. Put Together/ Take Apart with total unknown, added unknown or both addends unknown.* 2. Solve word problems that call for addition of three whole numbers whose sum ≤ 20.				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.1 Add and subtract within 20. 3. Determine whether a group of objects (up to 20) has an odd or even number of members. Write an equation to express the total as a sum of equal addends.			

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades K-2											
CCSSM Grade K				**CCSSM Grade 1**				**CCSSM Grade 2**			
Understand addition as putting together and adding to, and subtraction as taking apart and taking from.	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Understand and apply properties of operations and the relationship between addition and subtraction**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**		**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
1. Represent addition and subtraction with objects, fingers, mental images, drawings, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations. 3. Decompose numbers less than or equal to 10 into pairs in more than one way, e.g., by using objects or drawings, and record each decomposition by a drawing or equation (e.g., 5 = 2 + 3 and 5 = 4 + 1) 4. For any number from 1 to 9, find the number that makes 10 when added to the given number, e.g., by using objects or drawings, and record the answer with a drawing or equation.				3. Apply properties of operations as strategies to add and subtract.3 Examples: If 8 + 3 = 11 is known, then 3 + 8 = 11 is also known. (Commutative property of addition.) To add 2 + 6 + 4, the second two numbers can be added to make a ten, so 2 + 6 + 4 = 2 + 10 = 12. (Associative property of addition.) 4. Understand subtraction as an unknown-addend problem.				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.			
				Add and subtract within 20				**Add and subtract within 20**			
5. Fluently add and subtract within 5.				5. Relate counting to addition and subtraction. 6. Add and subtract within 20, demonstrating fluency for addition and subtraction within10. Use strategies such as counting on; making ten; decomposing a number; or using the relationship between addition and subtraction.				2. Fluently add and subtract within 20 using mental strategies. Know from memory all sums of two one-digit numbers.			
Notes/Examples:											

CCSSM Curriculum Analysis Tool 1—Number and Operations for in Base 10 for Grades 3-5

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials _____ **Publication Date** _____ **Grade Level(s)** _____

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CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NBT Number and Operations in Base Ten	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**4.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**5.NBT Number and Operations in Base Ten**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
				Generalize place value understanding for multi-digit whole numbers.				**Understand the place value system**			
				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.				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.			
								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 exponents to denote powers of 10.			

CCSSM Curriculum Analysis Tool 1—Number and Operations for in Base 10 for Grades 3-5											
CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	4.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	5.NBT Number and Operations in Base Ten	Chap. Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
				Generalize place value understanding for multi-digit whole numbers.				**Understand the place value system**			
				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.				3. Read, write, and compare decimals to 1000ths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.			
								4. Use place value understanding to round decimals to any place.			
Use place value understanding and properties of operations perform multi-digit arithmetic				**Use place value understanding and properties of operations to perform multi-digit arithmetic.**				**Perform operations with multi-digit whole numbers and with decimals to hundredths.**			
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.				4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.							
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.				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.				5. Fluently multiply multi-digit whole numbers using the standard algorithm.			

CCSSM Curriculum Analysis Tool 1—Number and Operations for in Base 10 for Grades 3-5											
Use place value understanding and properties of operations perform multi-digit arithmetic.	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Use place value understanding and properties of operations to perform multi-digit arithmetic.**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Perform operations with multi-digit whole numbers and with decimals to hundredths.**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
				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.				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.			
								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.			
Notes and Examples											

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5

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CCSSMGrade 3				CCSSM Grade 4				CCSSM Grade 5			
3.OA Operations and Algebraic Thinking	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**4.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**5.OA Operations and Algebraic Thinking**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Represent and solve problems involving multiplication and division.				**Use the four operations with whole numbers to solve problems**				**Write and interpret numerical expressions**			
1. Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each.				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 equations.				1. Use parentheses, brackets, or braces in numerical expressions and evaluate expressions with these symbols.			
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 when 56 objects are partitioned into equal shares of 8 objects each.								2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.			
3. Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities.				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.							

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5											
CCSSM Grade 3				**CCSSM Grade 4**				**CCSSM Grade 5**			
3.OA Operations and Algebraic Thinking	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**4.OA Operations and Algebraic Thinking**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**5.OA Operations and Algebraic Thinking**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
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 these equations:* 8 x ? = 48, 5 = □ ÷ 3, 6 x 6 = ?.											
Understand properties of multiplication and the relationship between multiplication and division				**Gain familiarity with factors and multiples.**							
5. Apply properties of operations as strategies to multiply and divide. *Examples: Commutative Property of Multiplication; Associative Property of Multiplication; Distributive Property).*				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.							
6. Understand division as an unknown-factor problem.											
Multiply and Divide											
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). Know from memory all products of 2 one-digit numbers) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit number.											

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CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5											
CCSSM Grade 3				**CCSSM Grade 4**				**CCSSM Grade 5**			
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Use the four operations with whole numbers to solve problems**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**		**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
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. 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. Asses the reasonableness of answers using mental computation and estimation strategies including rounding							
Solve problems involving the four operations, and identify and explain patterns in arithmetic.				**Generate and analyze patterns**				**Analyze patterns and relationships**			
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*				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.*				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 the coordinate plane. *For example, given the rule "Add 3" and 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.*			

CCSSM Curriculum Analysis Tool 1—Operations and Algebraic Thinking for Grades 3-5
Notes/Examples:

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5

Name of Reviewer _____ **School/District** _____ **Date** _____

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CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NF Number and Operations—Fractions	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**4.NF Number and Operations— Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**	**5.NF Number and Operations—Fractions**	**Chap Pages**	**Content N-L-M-A-H**	**Bal N-L-M-A-H**
Develop understanding of fractions as numbers.				**Extend understanding of fraction equivalence and ordering**				**Apply and extend previous understandings of multiplication and division to multiply and divide fractions**			
G2. Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. 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 $1/b$.				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, by using a visual fraction model.				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.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5

CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NF Number and Operations—Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	4.NF Number and Operations— Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations—Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H
Develop understanding of fractions as numbers				**Extend understanding of fraction equivalence and ordering**				**Apply and extend previous understandings of multiplication and division to multiply and divide fractions**			
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.				4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*				5. Interpret multiplication as scaling (resizing), 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.			
				Extend understanding of fraction equivalence and ordering				**Use equivalent fractions as a strategy to add and subtract fractions**			
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.				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. Recognize/generate equivalent fractions.				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.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5

CCSS Grade 3				CCSS Grade 4				CCSS Grade 5			
3.NF Number and Operations—Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	4.NF Number and Operations— Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations—Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H
Develop understanding of fractions as numbers				**Extend understanding of fraction equivalence and ordering**				**Use equivalent fractions as a strategy to add and subtract fractions**			
. Explain equivalence of fractions in pecial cases. and compare fractions y reasoning about their size. . Compare two fractions with the ame numerator or the same enominator by reasoning about their ze. Recognize that comparisons are alid only when the two fractions efer to the same whole. Record the esults of comparisons with the ymbols >, =, or <, and justify the onclusions.				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.				2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.			
				Build fractions from unit fractions y applying and extending previous understanding of operations on whole numbers				**Apply and extend previous understanding of multiplication and division to multiply and divide fractions**			
				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—justify decomposition c. Add and subtract mixed numbers with like denominators. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators.				3. Interpret a fraction as division of the numerator by the denominator. Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers.			

CCSSM Curriculum Analysis Tool 1—Number and Operations--Fractions for Grades 3 - 5

Grade 3				Grade 4				Grade 5			
3.NF Number and Operations—Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	4.NF Number and Operations— Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations—Fractions	Chap Pages	Content N-L-M-A-H	Bal N-L-M-A-H
				Build fractions from unit fractions y applying and extending previous understanding of operations on whole numbers				**Apply and extend previous understanding of multiplication and division to multiply and divide fractions**			
				4. Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. 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.				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 $a \times q \div b$. 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.			
				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.[4]				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 multiplying b. Explaining why multiplying a given number by a fraction is greater than 1 results in a product greater than the whole number; explaining why multiplying a number by a fraction that is less than 1 results in a product smaller than the number.			

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5

Grade 3				Grade 4				Grade 5			
	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H		Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations—Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H
								Apply and extend previous understanding of multiplication and division to multiply and divide fractions			
								6. Solve real world problems involving multiplication of fractions and mixed numbers.			
								7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. a. Interpret division of a unit fraction by a non-zero whole and compute such quotients. b. Interpret division of a whole number by a unit fraction, and compute such quotients.			

Notes and Examples:

CCSSM Curriculum Analysis Tool 1—Number and Operations—Fractions for Grades 3 - 5

Grade 3				Grade 4				Grade 5			
	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H		Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H	5.NF Number and Operations—Fractions	Chap. Pages	Content N-L-M-A-H	Bal N-L-M-A-H
								7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. 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.			

Notes and Examples:

CCSSM Curriculum Analysis Tool 1—Ratios and Proportions for Grades 6-8

Name of Reviewer _____ **School/District** _____ **Date** _____

Name of Curriculum Materials _____ **Publication Date** _____ **Grade Level(s)** _____

Content Coverage Rubric (Cont):
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CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.RP Ratios and Proportional Relationships	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.RP Ratios and Proportional Relationships**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap. Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Understand ratio concepts and use ratio reasoning to solve problems.				**Analyze proportional relationships and use them to solve real-world and mathematical problems.**				**Understand connections between proportional relationships, lines, and linear equations.**			
1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak."				1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.				5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.			

CCSSM Curriculum Analysis Tool 1—Ratios and Proportional Relationships for Grades 6-8												
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**				
Understand ratio concepts and use ratio reasoning to solve problems.				**Analyze proportional relationships and use them to solve real-world and mathematical problems.**				**Understand connections between proportional relationships, lines, and linear equations.**				
2. Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."				2. Recognize and represent proportional relationships between quantities. 2a. Decide whether two quantities are in a proportional relationship by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 2d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation.				6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.			
3. Use ratio and rate reasoning to solve real-world and mathematical problems by reasoning. 3c. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.				2b. Identify the constant of proportionality in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 2c. Represent proportional relationships by equations.								
3a. Make tables of equivalent ratios relating quantities with whole umber measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.				3. Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.*								
3b. Find a percent of a quantity as a rate per 100; solve problems involving finding the whole, given a part and the percent.												
3d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.												

CCSSM Curriculum Analysis Tool 1—Ratios and Proportional Relationships for Grades 6-8
Notes and Examples:

CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8

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CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.G Geometry	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Solve real-world and mathematical problems involving area, surface area, and volume.				**Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.**				**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.***			
1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.				4. Know the formulas for area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.							
2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply formulas $V=l\,w\,h$ and $V = bh$ to find volumes to solve real-world and mathematical problems.				6. Solve real-world and mathematical problems involving area, volume, and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.							

CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8										
CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.G Geometry	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	7.G Geometry	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	8.G Geometry	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
Solve real-world/math problems involving area, surface area, and volume.				**Solve real-world/math problems involving angle measure, area, surface area, and volume.**				**Solve real-world/ mathematical problems involving volume of cylinders, cones, and spheres.**			
4. Represent 3-dimensional figures using nets of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.				3. Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.				9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.			
				Draw, construct, and describe geometrical figures and describe the relationships between them.				**Understand congruence and similarity using physical models, transparencies, or geometry software.**			
3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate.				5. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.				5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.			
								1. Verify the properties of rotations, reflections, and translations: a. lines are taken to lines and the line segments to line segments of the same length; b. angles are taken to angles; c. parallel lines are taken to parallel lines.			
								3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.			
				1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.				4. Understand that a 2-dimensional figure is similar to another if the second can be obtained from the first by rotations, reflections, translations, and dilations; given two similar figures, describe sequences that make them similar.			

CCSSM Curriculum Analysis Tool 1—Geometry for Grades 6-8										
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.G Geometry	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.G Geometry**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
				Draw, construct, and describe geometrical figures and describe the relationships between them.				**Understand congruence and similarity using physical models, transparencies, or geometry software.**			
				2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.				2. Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits congruence between them.			
								Understand and apply the Pythagorean Theorem			
								6. Explain a proof of the Pythagorean Theorem and its converse.			
								7. Apply the Pythagorean Theorem to determine the unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.			
								8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.			

Notes/Examples:

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8

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CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.EE Expressions and Equations	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Apply and extend previous understandings of arithmetic to algebraic expressions				**Use properties of operations to generate equivalent expressions**				**Work with radicals and integer exponents**			
1. Write and evaluate numerical expressions involving whole number exponents.								1. Know and apply the properties of integer exponents to generate equivalent numerical expressions.			
								4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.			

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8											
CCSSM Grade 6				**CCSSM Grade 7**				**CCSSM Grade 8**			
6.EE Expressions and Equations	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Apply and extend previous understandings of arithmetic to algebraic expressions				**Use properties of operations to generate equivalent expressions**				**Work with radicals and integer exponents**			
2. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. b. Identify parts of an expression using mathematical terms (sum, term, product, quotient, coefficient); view one or more parts of an expression as a single entity.											
c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations that include whole-number exponents, in the order when there are no parentheses to specify order.				1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.							
3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property or properties of operations.*				2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities are related.							
4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).											
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or any number in a specified set.											

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8										
CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.EE Expressions and Equations	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**7.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**8.EE Expressions and Equations**	**Chap Pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**
Reason about and solve one-variable equations and inequalities				**Solve real life and mathematical problems using numerical and algebraic expressions and equations**				**Analyze and solve linear equations and pairs of simultaneous linear equations**			
5. Understand solving an equation or inequality as a process of answering a question: Which values form a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.								7. Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.			
7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.				4. Use variables to represent quantities in a real-world and mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **a.** Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, r are specific rational numbers. Solve equations like these fluently.							
8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of inequalities on number lines.				**b.** Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.							

CCSSM Curriculum Analysis Tool 1—Expressions and Equations for Grades 6-8											
CCSSM Grade 6				CCSSM Grade 7				CCSSM Grade 8			
6.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	7.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H	8.EE Expressions and Equations	Chap Pages	Cont N-L-M-A-H	Bal N-L-M-A-H
								8. Analyze and solve pairs of linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. c. Solve real-world and math problems leading to two linear equations in two variables.			
Notes/Examples:											

CCSSM Curriculum Analysis Tool 1—Interpreting Functions in Grades 9-12

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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Explanation
Interpreting Functions (F-IF)				
Understand the concept of a function and use function notation				
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.				
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.				
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.				
Interpret functions that arise in applications in terms of the context				
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*				

CCSSM Curriculum Analysis Tool 1—Interpreting Functions in Grades 9-12				
CCSSM Standards Grades 9-12	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*				
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.				
Analyze functions using different representations				
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.				
8. Graph linear and quadratic functions. Show intercepts, maxima, & minima.				
9. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.				
10. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.				
11. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.				
12. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.				
13. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.				
14. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.				
15. Use the properties of exponents to interpret expressions for exponential functions.				
16. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of a quadratic function and an algebraic expression for another, say which has larger maximum.*				

CCSSM Curriculum Analysis Tool 1—Reasoning with Equations and Inequalities in Grades 9-12

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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Explanation
Reasoning with Equations and Inequalities (A-REI)				
Understand solving equations as a process of reasoning and explain the reasoning.				
1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.				
2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.				
Solve equations and inequalities in one variable				
3. Solve linear equations/inequalities in one variable, including coefficients represented by letters.				
4. Solve quadratic equations in one variable.				
a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula.				
b. Solve quadratic equations by inspection, taking square roots, completing the square, the quadratic formula and factoring, as appropriate. Recognize when the quad. formula gives complex solutions.				

CCSSM Curriculum Analysis Tool 1—Reasoning with Equations and Inequalities in Grades 9-12				
CCSSM Standards Grades 9-12	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
Solve systems of equations				
5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.				
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.				
7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.				
8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.				
9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 × 3 or greater).				
Represent and solve equations and inequalities graphically				
10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).				
11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.				
12. Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.				

CCSSM Curriculum Analysis Tool 1—Interpreting Categorical and Quantitative Data in Grades 9-12

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Course(s) _____

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CCSSM Standards Grades 9-12	Chapter pages	Cont N-L-M-A-H	Bal N-L-M-A-H	Notes/Examples
Interpreting Categorical and Quantitative Data (S-ID)				
Summarize, represent, and interpret data on a single count or measurement variable				
1. Represent data with plots on the real number line (dot plots, histograms, and box plots).				
2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.				
3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).				
4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.				

CCSSM Curriculum Analysis Tool 1—Interpreting Categorical and Quantitative Data in Grades 9-12				
Summarize, represent, and interpret data on two categorical and quantitative variables	**Chapter pages**	**Cont N-L-M-A-H**	**Bal N-L-M-A-H**	**Notes/Explanation**
5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.				
6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.				
a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.				
b. Informally assess the fit of a function by plotting and analyzing residuals.				
c. Fit a linear function for a scatter plot that suggests a linear association.				
Interpret linear models				
7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.				
8. Compute (using technology) and interpret the correlation coefficient of a linear fit.				
9. Distinguish between correlation and causation.				

CCSSM Mathematical Practices Analysis Tool 2	Page 1

Name of Reviewer _____ School/District _____ Date _____

Name of Curriculum Materials _____ Publication Date _____ Grade Level(s) _____

Opportunities to Engage in the Standards for Mathematical Practices Found Across the Content Standards

Overarching Habits of Mind	1. Make sense of problems and persevere in solving them. *Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution.*	6. Attend to precision. *Mathematically proficient students try to communicate precisely to others.*
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		
Reasoning and Explaining	2. Reason abstractly and quantitatively. *Mathematically proficient students make sense of quantities and their relationships in problem situations.*	3. Construct viable arguments and critique the reasoning of others. *Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments.*
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		

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Modeling and Using Tools	4. Model with mathematics. *Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.*	5. Use appropriate tools strategically. *Mathematically proficient students consider the available tools when solving a mathematical problem.*
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		
Seeing Structure and Generalizing	7. Look for and make use of structure. *Mathematically proficient students look closely to discern a pattern or structure.*	8. Look for and express regularity in repeated reasoning. *Mathematically proficient students notice if calculations are repeated, and look both general methods and shortcuts.*
Evidence of how the Standards for Mathematics Practice were addressed (with page numbers)		

CCSSM Curriculum Materials Analysis Project--Overarching Considerations (Tool 3)

CCSSM Curriculum Analysis Tool 3 (Overarching Considerations)

This tool should be used after reviewing mathematics curriculum materials using Tool 1 (Content Analysis) and Tool 2 (Mathematical Practices Analysis). After reviewing the curriculum materials carefully, answer the questions below reflecting important overarching considerations with regard to the materials. Overarching considerations are those that support the teaching of Mathematics Core Content and Practices. **Equity:** NCTM (1991) calls for teachers to build on how students' linguistic, ethnic, racial, gender, and socioeconomic backgrounds influence their learning; to help students to become aware of the role of mathematics in society and culture; to expose students to the contributions of various cultures to the advancement of mathematics; and to show students how mathematics relates to other subjects; and to provide students with opportunities to apply mathematics to authentic contexts. CCSSM also notes that, "The Standards should be read as allowing for the widest possible range of students to participate fully from the outset, along with appropriate accommodations to ensure maximum participation of students with special education needs." **Formative Assessment** is a critical part of classroom instruction, and curriculum materials can provide a variety of levels of support with regard to information to teachers about student learning. Finally, the increasing availability of **technology** offers opportunities to use technology mindfully in ways that enable students to explore and deepen their understanding of mathematical concepts.

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Rubric for answering questions about Overarching Considerations:

Not Found (N) - The curriculum materials do not support this element.

Low (L) - The curriculum materials contain limited support for this element, but the support is not embedded or consistently present within or across grades.

Medium (M) - The curriculum materials contain support for this element, but it is not always embedded or consistently present within or across grades.

High (H) - The curriculum materials contain embedded support for this element so that it is consistently present within and across grades.

Questions about Overarching Considerations (Page 1)	See Rubric	Comments/Examples
Equity	**N-L-M-H**	
To what extent do the materials:		
1. Provide teachers with strategies for meeting the needs of a range of learners?		
2. Provide instructional support to help teachers sequence or scaffold lessons so that students move from what they know to what they do not know?		
3. Provide opportunities for teachers to use a variety of grouping strategies?		
4. Embed tasks with multiple entry-points that can be solved using a variety of solution strategies or representations?		
5. Suggest accommodations and modifications for English language learners that will support their regular and active participation in learning mathematics?		

Questions about Overarching Considerations (Page 2)	See Rubric	Comments/Examples
To what extent do the materials:	**N-L-M-H**	
6. Provide opportunities to use reading, writing, and speaking in mathematics lessons.		
7. Encourage teachers to draw upon home language and culture to facilitate learning?		
8. Encourage teachers to draw on multiple resources such as objects, drawings, and graphs to facilitate learning?		
9. Draw upon students' personal experiences to facilitate learning?		
10. Provide opportunities for teacher and students to connect mathematics to other subject areas?		
11. Provide both individual and collective opportunities for students to learn using mathematical tasks with a range of challenge?		
12. Provide opportunities for advanced students to investigate mathematics content at greater depth?		
13. Provide a balanced portrayal of various demographic and personal characteristics?		
Assessment		
14. Provide strategies for gathering information about students' prior knowledge and background?		
15. Provide strategies for teachers to identify common student errors and misconceptions?		
16. Assess students at a variety of knowledge levels (e.g., memorization, understanding, reasoning, problem solving)?		
17. Encourage students to monitor their own progress?		
18. Provide opportunities for ongoing review and practice with feedback related to learning concepts, and skills.		
19. Provide support for a varied system of on-going formative and summative assessment (formal or informal observations, interviews, surveys, performance assessments, target problems)?		

Questions about Overarching Considerations (Page 2)	See Rubric	Comments/Examples
Technology	**N-L-M-H**	
To what extent do the materials:		
20. Integrate technology such as interactive tools, virtual manipulatives/objects, and dynamic mathematics software in ways that engage students in the Mathematical Practices?		
21. Include or reference technology that provides opportunities for teachers and/or students to communicate with each other (e.g. websites, discussion groups, webinars)?		
22. Include opportunities to assess student mathematical understandings and knowledge of procedural skills using technology?		
23. Include or reference technology that provides teachers additional tasks for students?		
24. Include teacher guidance for the mindful use of embedded technology to support and enhance student learning?		

Notes/Examples:

Summary Discussion Questions

1. Equity: To what extent do the materials contain embedded support for elements of equity consistently within and across grades?
2. Assessment: To what extent do the materials contain embedded support for elements of assessment consistently within and across grades?
3. Technology: To what extent do the materials contain embedded support for elements of technology consistently within and across grades?
4. Overall: To what extent do the materials incorporate the Overarching Consideration elements to advance students' learning of mathematical content and engagement in the mathematical practices?