DRAFT
Curriculum Framework and Evaluation Criteria Committee Guidelines for the 2013 Revision of the *Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve*

The following draft guidelines are based on statutory requirements, oral comments from the four focus group meetings held in February and March 2012, and written comments received in February and March 2012.

Once approved by the State Board of Education (SBE), the guidelines will direct the work of the Mathematics Curriculum Framework and Evaluation Criteria Committee (CFCC).

1. **In general, the revised *Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve (Mathematics Framework),* shall:**

    A. Be aligned to the *Common Core State Standards for Mathematics* (*CCSS*) adopted by the SBE in August 2010, with an emphasis on the *Common Core State Standards for Mathematics* developed by the Common Core State Standards Initiative and published in June 2010*.

    B. Also support implementation of the California additions that are consistent with the overall design and progression of the CCSS.

    C. Be consistent with and supportive of the focus, coherence, rigor, and depth of the CCSS.

    D. Clearly state the basic overarching purpose and goals of the *Mathematics Framework.*

    E. Provide a clear and concise narrative that serves the needs of teachers, curriculum leaders, and students and that reflects current and confirmed research in mathematics.

    F. Support a progression of learning from kindergarten through high school that ensures all students can achieve college and career readiness.

    G. Be consistent with the SMARTER Balanced Assessment Consortium (SBAC) assessment specifications and support materials produced by the SBAC.

    H. When appropriate, utilize work done by education stakeholders, including other states, national organizations, and the SBAC and Partnership for Assessment of Readiness for College and Careers (PARCC) assessment consortia, to support the implementation of the CCSS.

I. Reflect the goal of achieving balance in mathematics instruction, including conceptual understanding, problem solving, and procedural skills and how they are consistent with the CCSS's assessment specifications.

J. Provide guidance on standards-based curriculum and instruction as follows:

- Support instruction and learning of the mathematical practices standards. Provide examples of how to connect mathematical practices to the content standards that encourage students to think and reason mathematically.

- Support learning progressions and foundations that prepare students for algebra, higher mathematics, and college and career readiness, as outlined in the chart developed by Student Achievement Partners (see The Progress to Algebra Continuum in K–8, page 9).

- Provide standards-based sample problems within the grade-level or grade-span chapters/sections.

K. When appropriate, follow the organization and design of other standards-based frameworks (e.g., physical education and reading/language arts) and be of approximately the same length.

L. Emphasize why it is important and enjoyable for students to learn and use mathematics.

M. Feature an appendix with current resources including links to online resources.

N. Be a living document with links to implementation tools, research-based instructional practices, and high-quality research.

O. Address the language demands of mathematics for all students.

P. Provide guidance on the manner in which content can be delivered to build the skills of creativity and innovation, critical thinking and problem solving, collaboration, communication, and construction and new understandings of knowledge, pursuant to *Education Code* Section 60207(d).

2. **The revised *Mathematics Framework* will address the issues related to mathematics instruction in grades eight and beyond and include the following:**

A. A clear statement that the kindergarten through grade eight CCSS (developed by the Common Core State Standards Initiative and published in June 2010) are a pathway to higher mathematics starting with either Algebra I or Integrated Mathematics I.

B. Discussion of options for middle school acceleration to support Algebra I or Integrated Mathematics I prior to ninth grade that are consistent with other Common Core states.

C. Discussion of how some California additions to the grades six and seven standards may inform a description of an accelerated path to higher mathematics starting with either Algebra I or Integrated Mathematics I.

D. Guidance on students' readiness for Algebra I or Integrated Mathematics I, including assessment of prerequisite knowledge and skills and appropriate placement.

E. Suggested courses for both Traditional (Algebra I, Geometry, Algebra II) and Integrated (Integrated Mathematics I, II, III) high school mathematics pathways that are consistent with other Common Core states. The content of these courses shall be the same regardless of the grade level at which they are taught and applicable to and supportive of non-traditional instruction and learning.

F. The course of Algebra I will be composed of the CCSS (developed by the Common Core State Standards Initiative and published in June 2010) in place of the unique California Grade 8 Algebra I standards. The content of the CCSS-based Algebra I course shall be the same regardless of the grade level at which the course is taught.

3. **The revised *Mathematics Framework* will address instructional strategies and support, including the following:**

A. Research on mathematics education and instructional strategies (e.g., learning theories, brain research, why some students have difficulty learning mathematics and how best to help these students).

B. Explanations and examples of instructional strategies that develop students' critical thinking skills and conceptual understanding, support student discourse on mathematics topics, and help students apply mathematics to solve real world problems (e.g., using mathematical modeling and that may involve environmental principles and concepts).

C. Support for instruction that integrates the standards for mathematical practice with the standards for mathematical content.

D. Examples of approaches to instruction using real world problems and performance tasks to develop students' mathematical understanding.

E. Making connections between classroom instruction and extended learning programs and activities.

F. Planning instruction and designing lessons using multiple texts and resources for conceptual development.

4. **The revised Mathematics Framework will address professional development and include the following:**

   A. Information on the importance of teachers' mathematical content knowledge as well as pedagogy.

   B. Support for instruction focused on critical grade level content and learning progressions.

   C. Guidance on how to help students deepen their understanding of mathematics by combining mathematical practice and content.

   D. A focus on incorporating the standards for mathematical practice.

   E. Discussions on effective models of professional development (e.g., lesson study, coaching, and cycle of inquiry).

   F. Professional resources and references.

   G. Professional development for administrators and support for parents/families and other stakeholders.

   H. Development of professional learning communities to promote ongoing professional growth and development and to inform effective instructional practice.

   I. Universal design for learning.

   J. Differentiated instruction for English learners, limited English only students, advanced learners, and students with special needs.

5. **The revised *Mathematics Framework* will address the topic of assessment and include the following:**

   A. Clarification on the purposes of various types of assessment (e.g., entry-level, diagnostic, interim, ongoing formative, and summative).

   B. Guidance on the use assessment results to modify instruction and improve student achievement.

   C. Current information on California's assessment of mathematics (e.g., statewide assessment, SBAC assessments).

D. Guidance on assessments that test the skills and knowledge necessary for appropriate placement of students in higher level mathematics courses.

E. Guidance on developing and using assessments that measure conceptual understanding and problem solving.

6. The revised *Mathematics Framework* will incorporate universal access and support teachers in providing standards-aligned instruction to all learners. The framework will include:

A. Guidance on making academic language and mathematics vocabulary accessible to all students.

B. Specific examples of differentiated instruction.

C. Research-based instructional strategies, including the use of technology, to meet the needs of all students, including:

- English learners, including English language development strategies that are consistent with the English language development standards that will be adopted in 2012 and strategies for students at multiple levels of language proficiency, including long-term English learners, with specific reference to *Improving Education for English Learners: Research-Base Approaches*.

- Advanced learners.

- Students with disabilities.

- Students who are falling behind in mathematics.

- Students with reading skills below grade level.

D. Current research on the benefits of reading, writing, speaking, and listening about mathematics.

E. Examples of effective instructional strategies at various grade levels that include pre-teaching and a focus on good first instruction.

F. Information on early and tiered intervention.

G. Strategies for sheltering the content, including but not limited to Specially Designed Academic Instruction in English (SDAIE) and sheltered instruction.

H. Information to help teachers understand why students make common mistakes and how to address them.

I. Guidance on how to assess math skills and support student learning regardless of the lack of English language proficiency.

7. **The revised *Mathematics Framework* will address technology as a tool for instruction and learning and include the following:**

    A. Clarification on the role of technology as a tool to support conceptual understanding, real-world problem solving, collaboration, communication, and modeling.

    B. Support for the strategic use of technology in the classroom at different grade levels and for different purposes.

    C. Information regarding the use of technology for assessment.

    D. References to technology-based tools for instruction and learning (e.g., performance tasks, procedural practice, mathematical modeling, graphing, and electronic manipulatives).

    E. Information on the role of technology in professional development and resources for online professional development.

    F. Discussion on the role of technology in supporting universal access.

8. **The revised *Mathematics Framework* will include a chapter on instructional materials that incorporates the criteria for evaluating K–8 instructional materials and general information.**

    The criteria for evaluating K–8 instructional materials will:

    A. Require alignment to the standards for mathematics adopted by the SBE in August 2010 with an emphasis on the Common Core State Standards for Mathematics developed by the Common Core State Standards Initiative and published in June 2010.

    B. Request that publishers and producers of instructional materials provide assessments at each grade level:

        • To test the skills and conceptual understandings necessary to prepare all students for success in higher level mathematics.

        • To test students' facility with the mathematical practice standards.

    C. Request that publishers and producers of instructional materials provide embedded assessments and guidance on their use in the classroom.

D. Require instructional materials to be consistent with the revised framework.

E. Include instructions to publishers and producers of instructional materials to incorporate strategies for English learners that are consistent with the English language development standards scheduled to be adopted by the SBE in September or November 2012, pursuant to *EC* Section 60204(b)(1).

F. Include instructions to publishers and producers of instructional materials to incorporate instructional strategies to address the needs of students with disabilities in both lessons and teacher's editions, as appropriate, at every grade level and subject, pursuant to *EC* Section 60204(b)(2).

G. Include specific criteria for technology-based instructional materials (e.g., e-books, Web-based programs) and online curriculum.

H. Call for basic K–8 grade level instructional materials that include intervention strategies and support materials that are incorporated into the basic program.

The general information section of the chapter will include guidance on selecting:

A. Specialized instructional materials (e.g., instructional materials in alternate formats).

B. Supplemental instructional materials.

C. High school-level instructional materials.

9. **The revised *Mathematics Framework* will satisfy statutory requirements.**

The revised framework must reflect changes in statute affecting the mathematics curriculum and instructional materials that have been enacted since the last revision of the *Mathematics Framework*. This includes but is not necessarily limited to the following:

A. Financial preparedness as required by *EC* Section 51284, which states:

After January 1, 2003, and concurrently with, but not prior to, the next revision of text books or curriculum frameworks in the social sciences, health, and mathematics curricula, the State Board of Education shall ensure that these academic areas integrate components of human growth, human development, and human contribution to society, across the life course, and also financial preparedness.

B. Requirements for the content of the curriculum framework as set forth in *EC* Section 60207 (AB 250, Chapter 608, Statutes of 2011):

- English language development strategies, pursuant to *EC* Section 60207(b).

- Strategies to address the needs of students with disabilities, pursuant to *EC* Section 60207(c).

- Descriptions of the manner in which content can be delivered to build the skills of creativity and innovation, critical thinking and problem solving, collaboration, communication, and construction and new understandings of knowledge, pursuant to *EC* Section 60207(d).

C. Discussion of how the framework can support mathematics instruction in transitional kindergarten programs established pursuant to *EC* Section 48000.

The Progress to Algebra Continuum in K–8

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

Source: P.Daro, W. McCallum, and J. Zimba (unpublished), Student Achievement Partners