# MATHEMATICS FRAMEWORK **FOCUS GROUP INPUT REPORT**

A Summary of Oral Comments Received at the August–October 2019 Mathematics Focus Group Meetings, and a Compilation of Written Comments Received in August Regarding the 2021 Revision of the *Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve*

California Department of Education November 2019

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## Introduction

As part of the process for revising curriculum frameworks, the *California Code of Regulations,* Title 5, Section 9511(c) requires the California Department of Education (CDE) to convene four public focus groups of educators in different regions of California to provide comment to the Instructional Quality Commission, Curriculum Framework and Criteria Committee, and State Board of Education. The *Mathematics Focus Group Input Report* encapsulates the comments from each of the meetings and informs the 2021 revision of the *Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve* (*Mathematics Framework*).

The report includes a list of questions provided to participants and the public to frame each focus group discussion and solicit oral and written comments. The report is divided into four sections. The first section contains a summary of all oral comments made at each of the focus group meetings by focus group members and members of the public. The second section of the report is a compilation of written comments received from both focus group members and members of the public for each of the four meetings in August 2019. The Focus Group Input Report includes two appendices. Appendix A features a list of resources and research cited in oral and written comments. Appendix B represents input from student focus groups, a pilot project that could serve as a model for future curriculum framework development.

The focus groups were held on the following dates in the following locations:

* August 19, 2019 – San Diego County Office of Education
* August 20, 2019 – Sacramento County Office of Education
  + Humboldt County Office of Education and Shasta County Office of Education, via videoconference
* August 22, 2019 – Santa Clara County Office of Education
  + Fresno County Office of Education, via videoconference
* August 26, 2019 – Olive Middle School, Baldwin Park Unified School District

Facilitators recorded audio of the meetings; copies can be made available by the CDE upon request.

## Background

The final discussion questions used for the Mathematics Focus Groups reflect a desire to elicit detailed information that largely avoided feedback that was too specific, or that would prove extemporaneous for the drafting of the guidelines that the Curriculum Framework Evaluation and Criteria Committee (CFCC) will use to revise the *Mathematics Framework*. The questions also reflect the awareness that a framework cannot set educational policy, change State Board of Education-adopted content standards, mandate pedagogical approaches or methods of instruction, or recommend one commercial product over others. In some cases, comments from the focus group members that appealed to these limitations were not included in the report because they will not influence the framework revision guidelines, the work of the CFCC, or the function of a curriculum framework. Comments in this report include the desire from focus group participants that the framework be interactive and include live links to videos, websites, and other instructional resources. The State Board of Education, which will ultimately adopt the revised *Mathematics Framework*, must consider the ways that authorizing these requests will mandate the ongoing availability of accessible content. While the process for ensuring compliance with accessibility standards is a necessary provision, the vigilance required to ensure the links are active and up to date would necessitate ongoing—and in the opinion of focus group facilitators, untenable—monitoring and maintenance.

## Mathematics Framework Focus Group Discussion Questions

The discussion questions were sent to all focus group members prior to the meetings and were posted on the CDE web page for public review. With an awareness of the limited amount of time available for discussion at each of the meetings (about two hours), the questions were designed to elicit feedback on the elements of the framework that provided strong guidance on the implementation of the standards, and call for feedback to guide what elements needed to be included in the revised framework. For example, the questions guided the members of the focus groups and the public to provide insights, expertise, and examples for how to further support the standards for mathematical practices (SMPs), to identify new instructional strategies, and to provide relevant resources and research on the integration of technology, literacy development, and integrated instruction, and expectations based on the continued implementation of the *California Common Core State Standards for Mathematics* (CA CCSSM)*.*

The following five questions were the basis for the focus group discussions and the oral and written comments contained in this report.

1. What are the strengths of the *2013 Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve* (*Mathematics Framework*) that you feel should remain in the revised version?
2. Implementation of the *California Common Core State Standards* (CA CCSSM) *for Mathematics* has been varied across the state. What changes to the 2013 *Mathematics Framework* would better support local education agencies and teachers as they implement both the content standards and the standards for mathematical practice?
3. How can the revised *Mathematics Framework* better support access to the standards-based curriculum for all students, including English learners, students with disabilities, gifted students, and other groups of students with special needs?
4. Assessment of student progress is essential for student success. What specific supports would you include in the revised *Mathematics Framework* to provide more guidance on effective means of student assessment?
5. Finally, what other recommendations do you have to ensure that the revised *Mathematics Framework* is a useful tool for California’s educators?

## Oral Comments

### Focus Group 1: August 19, 2019 San Diego County Office of Education

#### Focus Group Members Present:

| Member Name | Employer |
| --- | --- |
| Mark Alcorn | San Diego County Office of Education |
| Tammy Foster | Escondido Union School District |
| Lori Freiermuth | Sweetwater Union High School District |
| Erin Fraser | Oceanside Unified School District |
| Chandra Goodnough | Sweetwater Union High School District |
| Kim Hollowell | Vista Unified School District |
| Abigail Leaf | Escondido Union High School District |
| John Moreno | Carlsbad Unified School District |
| Brian Shay | San Dieguito Union High School District |
| Matthew Story | Moreno Valley Unified School District |

#### Focus Group Discussion Notes:

**Question 1:**

What are the strengths of the *2013 Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve* (*Mathematics Framework*) that you feel should remain in the revised version?

* The format for delivering information through examples is appreciated by teachers.
* The storylines conveying information on particular mathematical content, courses, or sections are powerful.
* The appendices are strong accompaniment to the chapters, especially the appendix on universal access.
* It’s helpful that each chapter or grade begins with the Standards for Mathematical Practices (SMPs) and what they look like at each grade level.
* I like seeing clear teacher actions and student actions.
* The K–8 chapters include depth and variety.
* The high school chapters start with modeling and functions.
* Continue providing explanations intended for some of the tougher content standards.
* Teachers like the examples so much that they want more.
* They really like the essential learnings at the beginning and the overview at the end of each chapter.
* The SMPs should be consistent and remain front and center.
* The mention of “key advance” is important.
* Keep the table with the questions addressing the SMPs.
* The visuals help structure the math practices, and the graphics are strong and user friendly.
* I like the chart on vertical alignment, along with notes on coherence that reference previous grades and speak to vertical alignment.
* The chart in the modeling unit, which describes different levels of modeling, is strong.
* It’s important to keep the discussion of “equal measure of procedure fluency,” but it should be articulated not through the image of a stool (as is), but an equilateral triangle. This way, the other two thirds are emphasized. The graphic should be an equilateral triangle, where conceptual understanding, application, and procedural fluency represent equal parts.
* Elementary chapters nicely pair visual examples with written explanations in tandem.
* For K–5, I appreciate how every chapter is structured the same.
* Keep major standards and supporting additional samples tables in the front matter of the chapters.
* The shaded grey/blue boxes throughout the framework that define fluency and include callouts for focus and rigor are effective.
* I like that the framework discusses mental math in almost every grade-level chapter.
* I’d like to call out the strength of the flowchart on page 14 (the big arrow).
* Critical areas of the lower grades are wonderful and would be useful for high school teachers to look back on and see where students have been.
* The defined fluencies are strong.
* The instructional strategies chapter is strong, particularly the five practices.

**Question 2:**

Implementation of the *California Common Core State Standards* (CA CCSSM) *for Mathematics* has been varied across the state. What changes to the 2013 *Mathematics Framework* would better support local education agencies and teachers as they implement both the content standards and the standards for mathematical practice?

* The framework should mimic the California Science Framework by linking content standards to the math practices to show that math is truly integrated.
* We need to see mathematical practices connected to the examples.
* I’d like to know a clear delineation of what we’re removing so that I can ensure quality instruction.
* The framework should be clear on the minimum level of understanding, then provide a utopian benchmark.
* Each grade should spell out what needs to be done well (using the California Standards for the Teaching Profession as a model), and how we can do them (and add depth).
* The framework should articulate skills and abilities.
* We need to have something like power standards (non-negotiables) to ensure a benchmark for learning.
* The framework should not include power standards. Language like this can make equity issues we are facing even more problematic.
* The framework should provide support—online workshops or instructional vignettes—to help teachers unpack the standards.
* There needs to be a flowchart for high school, and least for Integrated Math I through Integrated Math III.
* Teachers want links to videos or vignettes or classroom expectations.
* The high school chapters are half as thick as the K–8 chapters, which is a challenge for high school teachers.
* Having separate chapters for instructional strategies, universal access, supporting instructional practices means users who only access grade-level chapters skip this material. These components should be embedded in each grade level.
* Provide more options for high school courses (right now we have Pre-Calculus or Probability/Statistics, which neglect other courses).
* Include resources for students to access Integrated Math III or coding classes.
* Some standards are outdated, so the framework should not waste text on older (Calculus) standards.
* Content in the instructional strategies chapter and appendices should explicitly address equity.
* This document could be more closely aligned with strong statements put forth by the National Council of Teachers of Mathematics (NCTM) and research underscoring the right work in mathematics.
* Include the SMPs in the descriptive narrative sections for grade-level chapters.
* The framework should more effectively weave the SMPs and the content standards together.
* The course placement and sequencing appendix is referenced, but it should be stronger.
* Teachers want to see learning targets and success criteria to support planning for and establishing goals around instruction.
* Clarify certain references to materials and tools (What are “number bonds” and “tape diagrams”?).
* Be more explicit in the fact that teachers should know the standards.
* To support instruction, use of the teacher action/student action table in each grade-level chapter would be helpful.
* The instructional strategies chapter could have more depth and detail for high-leverage teaching practices.
* Develop more concrete and clear examples, and examples that approach single problems (or similar problem types) through different lenses or discipline lessons.
* The information in Appendix D for courses should come earlier. Including this information in an appendix does a disservice to grades six, seven, and eight.
* Include mathematical practices references in each grade level or domain.
* Include learning targets to help teachers understand student needs when they exit a grade level.
* Change the accessibility on the website with a layout that allows users to see all the content available (perhaps it includes two columns). Teachers don’t often scroll lower than their intended chapter.
* Include a chapter or some accompanying document addressing best practices and specific activities with the framework to support implementation. It could include sample activities and how to use the framework for professional development.
* It would be useful to include research on what other states are doing with implementation of the CCSSM.
* The framework should address what the task offers to teachers to garner a high percentage of student engagement.
* It would be great if CDE provided support to county offices to train teachers and support districts when the new framework is rolled out.
* Reduce the things teachers are required to teach and increase the depth of what is taught.
* Teachers need to have hard copy/printed versions.
* Include live links throughout the document.

**Question 3:**

How can the revised *Mathematics Framework* better support access to the standards-based curriculum for all students, including English learners, students with disabilities, gifted students, and other groups of students with special needs?

* Instructional strategy content should be embedded into each chapter and connected to a longer description in the instructional strategies chapter. It should include a perspective based on Universal Design for Learning (UDL).
* The instructional strategies appendix, specifically in how it speaks to the needs of English learners, should have more about sustained discourse and amplifying particular vocabulary in the grades (essential words to leverage success in future grades).
* Include common misconceptions for students who are struggling in chapters beyond TK–1, specifically the chapters for grades two and three.
* Include research on growth mindset and language routines (from Stanford). There is also content called Three Read Strategies.
* Integrate the ELD standards into the language of each chapter.
* Specific suggestions on how integrated English language development (ELD) looks in mathematics.
* The framework should articulate what the state believes all learners should be able to do.
* The framework should reinforce the brilliance and value of California’s students and the cultural capital they bring with them.
* There should be more modern research related to social justice, UDL, and equity.
* Language around acceleration and the detriment it does to learning should be stronger. Language around this needs to be stronger.
* Page 832 talks about the layered standards when repeating courses. Provide specific strategies for intervention. The framework should guide teachers on ways to turn around the mindsets of students facing compaction.
* A table of contents would help with efficiency and use.

**Question 4:**

Assessment of student progress is essential for student success. What specific supports would you include in the revised *Mathematics Framework* to provide more guidance on effective means of student assessment?

* Suggested teacher questions to ask for each area to pull out student thinking. Learning targets and success criteria.
* Good research around a broad definition of assessment is important. Include student self-assessment, holistic assessment, ways that math assessment relates to all learning.
* I wonder if the framework can speak to assessment for the whole child.
* There should be a stronger discussion of formative assessment, including an expansion of formative assessment strategies, what it looks like at every level, specifically for assessment math practice standards, not just the content standards.
* It would be nice to have a bank of question types at grade levels by standard so students can see the differences across grade level.
* Formative assessment strategies with explanations of the standards and claims are used on the California Assessment of Student Performance and Progress (CAASPP) test.
* The framework should articulate the purpose for assessment, including what teachers do with what they’ve assessed and how it informs what is being taught.
* The assessment section should talk about the strengths and weaknesses when educators go in a particular direction with assessment. We need to see scenarios or strengths and weaknesses of taking a particular approach.
* The grain sizes of the standards are not written at a lesson level. We need to see learning targets and how they don’t break down in a day.
* Elementary levels rely on curriculum for assessment. The framework must better inform teachers on the assessment they give.
* We have procedural or conceptual examples, but examples of performance tasks would help conclude grade-level chapters.
* Standards-based grading examples for the math practices.
* Link to the Smarter Balanced Digital Library, Smarter Balanced Interim Assessment Blocks, and resources to support how these areas of math assessment work together.

**Question 5:**

Finally, what other recommendations do you have to ensure that the revised *Mathematics Framework* is a useful tool for California’s educators?

* Provide sample lesson plans.
* Include content on teacher moves and student moves.
* Promote the Digital Library.
* Include advice to administrators on what they should be looking for in a high-functioning classroom and how they can support what they see.
* Provide research about the success of compaction classes (see work by Finkelstein).
* The options after Math III need to be addressed. How can Pre-Calculus be more coherent to actually bridge kids into Calculus? It’s missing after grade eight.
* Include links to videos to create buy-in from the community and showcase what people are doing well.
* The differences between eighth grade and Algebra I shocked me. The framework should speak more to how they relate.
* There is research and struggle with knowing about students advancing (local educational agencies [LEAs] who don’t track), specifically a traditional track versus an integrated track. There should be state-level stance on choice, along with the risks and rewards of advancing.

#### Public Comments:

| Name | Affiliation | Summary of Comments |
| --- | --- | --- |
| Bruce Grip | Retired teacher, 2013 Math Framework CFCC member | Mathematical Modeling is buried in Appendix B. Teachers in the field suffer from this; they miss out on information and the practice, value, and meaning of the material. Modeling should be a thread woven throughout the content in each grade. Regarding high school pathways: start with integrated, then include the traditional routes second. |
| Jim Nugent | CPM Ed Program | The current framework is insightful and provides good direction, but it’s not useable. Will publishers update standards maps and correlations? |
| Mary Ann Hawke | San Diego Unified School District GATE District Advisory Committee | Response to focus group question 3: There is language about advanced learners and gifted students (a page and a half), but the framework needs specific guidance for working with gifted math students. “Gifted” can include learning disabilities, asynchronicity, and other needs should be addressed and provided in teacher training. We need to review literature on teaching practices for gifted students (the previous content was based on research from 2008). |
| Jennifer Merowin | San Diego Unified School District GATE DAC | The framework should include standard assessments to help teachers address gaps. The cautionary language should help guide teachers in making decisions to meet student needs (regarding acceleration). Make progression clear, especially for readers who go to one chapter and don’t understand where learning is situated. |
| Dave Kootman | (none provided) | The framework should be considered something worth selling and marketing. Find a way to illustrate that it helps teachers. Build it through the lens of a company selling a product. |

### Focus Group 2: August 20, 2019 Sacramento County Office of Education

#### Focus Group Members Present:

| Member Name | Employer |
| --- | --- |
| Jaime Bonato | San Juan Unified School District |
| Jennifer Benoit | San Juan Unified School District |
| Elizabeth Julienne | San Juan Unified School District |
| Toni Torres | Pittsburg Unified School District |
| Abigail Bates | Lodi Unified School District |
| Fran Gibson | Sacramento County Office of Education |
| Michael Nordin | Roseville City School District |
| Deborah Coker | Tracy Unified School District |
| Carolyn Barney | Mount Diablo Unified School District |
| Andrea Ward | Mount Diablo Unified School District |

#### Focus Group Discussion Notes:

**Question 1:**

What are the strengths of the *2013 Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve* (*Mathematics Framework*) that you feel should remain in the revised version?

* I liked how there was attention to focus, coherence, and rigor.
* The framework’s organization by domain helps build familiarity with the relationships between contents.
* Major clusters with emphasis are helpful.
* I appreciate the narrative piece and how the stories are married with tables and visuals.
* Misconceptions in each domain are helpful, along with the links to tasks or elements of the curriculum.
* Keep the five guiding principles listed at the beginning, particularly the focus on equity.
* The instructional strategies section offers rich content and valuable resources.
* The presence of modeling (in the appendix) is vital.
* I like how grade-level chapters explain a student’s prior knowledge and skills.
* There is a lot of strength in mental math required to meet the standard, the discourse in math instructions, Singapore strategies, number talks, and math talks.
* Major clusters and supporting clusters are huge for our staff in understanding that not everything has the same weight.
* We love the layout. We know the organization will be consistent no matter what the level.
* I appreciate the traditional and integrated pathways.
* The progression chart is strong.
* I like that there is a specific chapter on TK, even though the standards say kindergarten.
* It’s very accessible in its digital form.
* I like that the framework calls out the fact that the SMPs should comprise 50 percent of the time, while content standards make up the other 50 percent. This message needs to be clear and strong going forward.
* Keep the preschool foundations and kindergarten expectations.

**Question 2:**

Implementation of the *California Common Core State Standards* (CA CCSSM) *for Mathematics* has been varied across the state. What changes to the 2013 *Mathematics Framework* would better support local education agencies and teachers as they implement both the content standards and the standards for mathematical practice?

* The framework should provide specific professional development on how to use the material.
* Guidance for teachers, including suggestions to support differentiation for students performing below, at, and above grade level.
* Hyperlinks need to be updated so teachers can access more examples and resources.
* If math practice standards and content standards each get 50 percent of the emphasis, the framework should provide guidance accordingly (divided between the two).
* Strengthen the compacted timelines and accelerated pathways for providing support for high school students looking to study math through Calculus.
* Teachers want a roadmap for all the visual models and when to use them.
* Include guidance to help users choose visual models and craft or adapt them to match the content or story. This could be something interactive and dynamic (like *Achieve the Core*’s mathematics coherence map does) and navigate stages in the learning progression.
* The progression documents are beautiful, but teachers often stick to their grade-level chapters.
* We need to see best practices around facilitating productive mathematical discourse and connecting to the SMPs.
* Merge content that the current framework separates. Chapters like instructional strategies and universal access should be blended, woven, and embedded throughout.
* It’s too easy to read content standards and miss the SMPs. Readers need to see how all these things are integrated in math (like science) paired with a visual representation.
* Present math standards in a way that allows teachers to see the Depth of Knowledge (DOK) levels and the critical thought involved.
* I both want and don’t want the grade-level chapters isolated. Address this conundrum by providing links from chapter to chapter to connect content with strategies and support (in the appendix, perhaps).
* Highlight ways other states outline and implement the SMPs. Howard County would be helpful to link to, along with the Kansas questions in the current framework.
* I’d love to see a rich domain vocabulary presented in a chart or table.
* Ensure sites and schools are vertically aligned and use common language.
* Provide connections to resources CDE provides (such as CAASPP, the Digital Library).
* Clarify focus standards for high school, and where high school teachers should focus.
* Provide a kind of rubric for LEAs to evaluate the framework implementation. Provide a statewide benchmark for assessing how the implementation process is going in a district or county.
* Expand examples and references to the use of coins (now in grade two) from TK up to emphasize the base ten structures the students will generalize later.
* Refer to Granite Schools coherence documents to inform how the framework provide essential math vocabulary for grade levels.
* Provide talking points—in accessible language—to help LEAs engage with stakeholders and provide assurances about math education.
* Examples would be stronger if they included videos of teachers showing teacher actions and what things look like in practice.
* The framework should be more dynamic and, in addition to internal links, should provide external links to curriculum and materials to provide direct access and support.

**Question 3:**

How can the revised *Mathematics Framework* better support access to the standards-based curriculum for all students, including English learners, students with disabilities, gifted students, and other groups of students with special needs?

* The instructional strategies section should include videos and links.
* Refer to transfer reasoning and how to address the needs of all students.
* Add clarity about Special Education classes, especially special day students and what is going on in classes.
* Explicitly call out best practices for specific groups within chapters. If you’re describing how to teach a concept by domain, there should be blurbs or visuals that call out these groups. They should echo the strategies and provide links to the section of the universal access section.
* The framework should promote the ways (beyond primary teachers) manipulation can build capacity for learning regardless of grade level.
* The framework should be explicit about how to maximize knowledge of whole numbers and generalize that toward skills that come later (talk moves, number talks).
* Guidance on one-to-one correspondence with students would support teachers as they ensure all students can make connections.
* Spell out discreet routines around benchmark numbers (“friendly” numbers, increments of tens) to promote kids learning more about the quantity they are manipulating.
* Be explicit about ways to maximize student knowledge of whole numbers and then generalize the knowledge as they acquire new skills. With talk moves, guide for ways to gradually release supports.
* Help specialists by providing a presentation of the standards in vertical and horizontal progression, like *Achieve the Core*’s coherence map.
* Provide guidance for ways to understand the continuum from Concrete to Visual to Abstract, and how to move back and forth with students. Research by Fisher speaks to this (called, “surface, deep, and transfer”).
* The framework should balance guidance and exploration. Avoid prescription or dictation, and instead provide areas for exploration.
* Include examples of near-, at-, and above-standard student work.
* Grade-level chapters can provide callouts to certain groups to unify the content in the framework. Specifically, include figures on the side of the page that says, “Here are some strategies for English learner (ELs). See Appendix X for more information.” It should also provide information and links to more resources within the framework.
* The framework should speak to math-based disparities related to race and equity.
* The math framework should connect to or align with ELD Standards and the *English Language Arts/English Language Development Framework* (*ELA/ELD Framework*)*.*
* Content should further emphasize ways to meet the needs of gifted students.
* Special Education teachers need increased support and guidance.
* Sentence frames and talk moves that are about ways to encourage math processing—not math answers—would be helpful.
* Make the framework a live document.

**Question 4:**

Assessment of student progress is essential for student success. What specific supports would you include in the revised *Mathematics Framework* to provide more guidance on effective means of student assessment?

* Provide clear criteria on formative versus summative, of learning versus for learning, and when it applies and when it doesn’t.
* Speak specifically to assessing for fluency.
* The assessment content can advocate for engaging students around rubrics so students can help process and access the next level.
* Student self-reflection would also be good.
* The chapter should include formative assessment alongside misconceptions around it. Jo Boaler calls these “Look fors,” which are cool and can help provide formative assessment questions or ideas.
* Including guidance on articulating learning goals and then developing success criteria is necessary.
* Add cautions about grading related to formative assessment. All formative assessment does not need to include a letter grade.
* Provide ways for teachers to do their own professional reading around formative assessment (exploration of Dylan Wiliam for example).
* There should be questions and answers based on standards that schools and groups can use to discuss what standards look like in the grade level classroom.
* Provide more specific examples of day-to-day and minute-to-minute formative assessment.
* Rubrics concern me. Consider the usefulness of adding more rubrics in a guidance document.
* Our performance tasks are built often. The framework could provide access to outside resources and libraries of resources for teachers to explore.

**Question 5:**

Finally, what other recommendations do you have to ensure that the revised *Mathematics Framework* is a useful tool for California’s educators?

* Include a technology chapter that addresses digital suites, not just popular math apps or games.
* More real-world examples related to finance, personal economics, and money at all grade levels.
* Provide clarity on who (subject) should do what (standards) with regard to financial literacy.
* The framework should be more user-friendly in its content and language.
* Provide recommendations for key areas to focus professional development and deepen mathematical knowledge.
* Organize the framework by progressions. The goal is to create teachers who are experts in progression at grades above and below the one they teach.
* We need data on framework use/access. Survey teachers who do/will use the framework. Can we have an “ask-a-teacher panel” along the way? If the framework was dynamic we could analyze this data.
* Address the commonality across frameworks that show how the content works together at particular levels.

#### Public Comments:

| Name | Affiliation | Summary of Comments |
| --- | --- | --- |
| Richard Newton | Tustin Unified School District | I want to emphasize the importance of call outs and scaffolds for intervention and extension. The accelerated pathway is a challenge, and more support is needed for middle and high school. We need priority clusters for high school grades. Grade-level newsletters can support public relations and clarify the purpose of the framework. |
| Jessica Sauko | CA STEM Network | I want more support in the framework for math in a STEM context, as well as integration and connection with science and computer science standards. We should speak more to the achievement gap in math and how districts can do a root-cause analysis around achievement gaps in particular grades or subject areas. The TK content is great, but we need to promote early math and how support early is successful long term. |
| Stacey Hernandez | San Juan Unified School District | Not enough teachers know about the framework. There needs to be a deliberate rollout statewide for this revised framework and create teacher leaders. So much research has emerged. Use this research to connect with the classroom teachers and promote the framework. |
| Dave Chun | Sacramento County Office of Education | The first framework provided great direction. Essential learnings for next grade levels could be woven into domain narrative along with cognitive reasoning. Students in high school need conceptual development and areas of focus around manipulatives. |
| Mike Fischer | Roseville Joint Union High School District | Teachers speak to skills gaps. The framework needs to do more to provide access (“low floor and high ceiling”). There needs to be room for more applied learning. STEM and finance were mentioned, but we need to show how math knowledge and projects can help transfer skills to their lives. Lists of specific projects for teachers to use would be helpful. |
| Ryan Keller | Humboldt County Office of Education | Shout out to the comment about the importance of early math support. The initiative and new work being done by CDE should inform the way the framework supports TK–3. |
| Rebecca Lewis | Shasta County Office of Education | Guidance around assessment in the early grades to support the establishment of a foundation. It should also guide on ways to support students who did not establish that foundation. |

### Humboldt County Office of Education (connected by video conference)

No Comments Received

### Shasta County Office of Education (connected by video conference)

No Comments Received

### Focus Group 3: August 22, 2019 Santa Clara County Office of Education

#### Focus Group Members Present:

| Member Name | Employer |
| --- | --- |
| Stacie Johnson\* | Hanford Elementary School District |
| Yolanda Herrera\* | Delano Elementary School District |
| Hilda Wright\* | Bakersfield City School District |
| Lynne Sindel | Salinas Union High School District |
| Ma Bernadette Salgarino | Santa Clara County Office of Education |
| Daniel Wekselgreene | San Mateo Union High School District |
| Marcey Winawer | Mountain View Los Altos High School District |
| Natalie Davis | Lafayette School District |

\* Denotes attendance via remote link from Fresno County Office of Education

#### Focus Group Discussion Notes:

**Question 1:**

What are the strengths of the *2013 Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve* (*Mathematics Framework*) that you feel should remain in the revised version?

* There is strength in the provision of strategies and attention to fluency and what it means.
* Linking and integrating standards is sometimes called out (matching/connecting). Expand on this to highlight effective integration.
* Teachers like to go through essential learnings to identify critical areas. Teachers appreciate the differences: concrete representations, counters, money, base ten blocks, as well as semi-concrete representations when students move to drawing or tape diagrams or number lines.
* It’s helpful that the examples use color to show teachers that it is an effective way to impart meaning.
* The connection between concrete and abstract is strong.
* I like the introduction (outlining the why/what of mathematics), but we need to develop what mathematics proficiency means.
* I like seeing the universal access and UDL, with examples.
* Technology section is strong.
* The examples are the strongest part of the framework. Emphasis on strategies and understanding concepts.

**Question 2:**

Implementation of the *California Common Core State Standards* (CA CCSSM) *for Mathematics* has been varied across the state. What changes to the 2013 *Mathematics Framework* would better support local education agencies and teachers as they implement both the content standards and the standards for mathematical practice?

* There should be greater depth and detail about building in the SMPs.
* Include support that develops teacher understanding of standards, such as the principles of improvement science, to better support implementation.
* Provide a greater emphasis on the SMPs to balance the representation.
* Include more sample tasks.
* The framework should focus on habits of mind and student behaviors, which are inherent in the SMPs.
* Include questions that help and support instructional planning.
* More middle schools are going to an accelerated math model. Include an appendix to illustrate the connections between grades.
* Provide Achievement Level Descriptors (ALDs) for each claim or cluster.
* Show where the math practices intersect with the content standards. Label them in a way that stands out, and keep the connection in one place rather than having users flip back and forth.
* Refer to research outlined in *Routines for Reasoning*, which is a good resource for providing how-to examples around the mathematical practices. It would be good to see how the content standards relate to DOKs.
* The framework should be so strong that it renders curriculum a separate tool. The framework should approach support from the belief that many teachers are dependent on traditional textbooks and resources.
* Include resources and strategies for approaching teaching learning in mathematics; currently, it’s a short blurb (“problem-based, and so on and so forth”).

**Question 3:**

How can the revised *Mathematics Framework* better support access to the standards-based curriculum for all students, including English learners, students with disabilities, gifted students, and other groups of students with special needs?

* Don’t provide information for all students in chapters that are separate from the grade-level chapters. Provide support for all special populations embedded throughout.
* There should be language stems, prompts, routines, questions, and other supports around math language. The framework should clarify specific content vocabulary.
* We need multiple representations and we need them in the standards and targets, not in the appendix.
* The document should call out concrete models, manipulatives, and tools consistently across the framework, and highlight their effects for different populations.
* Incorporate technology to support ELs, gifted students, and special populations.
* The framework should pair math standards with a call out that connects to the ELD standards and tools and strategies.
* Chapters can include more tasks at different achievement levels and DOKs.
* Revise tasks and examples in ways that increases access and uses real-life data.
* Link to and provide guidance based on the *EL Roadmap* and the *ELA/ELD Framework* to increase support for multilingual learners.
* Strategies for mathematical instruction needs to be enhanced and developed. Specifically, it would be beneficial for research-based high-level strategies. Consider a bank of strategies, exemplar lessons, work product, and lessons.
* Provide more around ways the collaborative process can facilitate the teaching of the SMPs.
* Provide examples of programming- and STEM-related content that show students representing math through programming.
* The mathematical language demands should extend to listening and conversing. The framework should leverage the idea that mathematics is a language.

**Question 4:**

Assessment of student progress is essential for student success. What specific supports would you include in the revised *Mathematics Framework* to provide more guidance on effective means of student assessment?

* Include more on how standards-based grading and assessment can help with leveling of standards and allow teachers to create meaningful assessment.
* Speak to the difference between reengagement versus re-teaching. Base this content around what comes after formative assessment in the assessment process.
* The framework should guide teachers with ways to leverage math claims when teaching lessons. The claims help drive the SMPs and can include targets.
* Emphasize student work to promote student and teacher reflection around assessment.
* The framework could reference the Program for International Student Assessment as a resource. It could include indicators to help students assess their collaboration.
* Provide a task at each level and each domain.
* The framework should address the cultural change(s) needed around assessment.
* Different tests by ALDs and DOKs could inform and clarify what students know or need to know.
* There's a need for K–2 examples around strategies and language for assessment.
* Highlight what teachers do with student strengths and student weaknesses.

**Question 5:**

Finally, what other recommendations do you have to ensure that the revised *Mathematics Framework* is a useful tool for California’s educators?

* The framework must call out equity, social justice, identity, and cultural representation.
* Place equity on the same level as the pillars of rigor and relevancy.
* Include more development around fluency and the need to emphasize how to recognize it in the classroom.
* Address 21st Century skills (the Four Cs) to support the SMPs.
* Address global competencies (in the introduction) and articulate the state’s sustainable goals and show connections with math models and math practices.
* Add more colors to the framework!
* Embed anchor tasks for targets and domain standards in the document.
* The framework should include purposeful questions for each domain.
* The framework should focus more on depth, less on content, especially in high school.
* The framework should define what “smart in mathematics” looks like.
* Technology and computer science should connect with the math framework—either in an appendix or woven throughout.
* Include a model for fourth year of mathematics.
* Add a search feature in the framework that allows me to find things by word or term.
* The framework should address early mathematics for students from 0–5-years old.
* Include reference to, or perhaps a conversation around, the eight teaching practices mentioned in the *Principals to Action*.

**Public Comments:**

| Name | Affiliation | Summary of Comments |
| --- | --- | --- |
| Gail Standiford | Retired mathematics teacher  Regional coordinator for CPM  UC Davis Math Project  Charter School Enrichments | Pacing and time is an issue. We should prioritize the essential standards for secondary grades ala NCTM’s *Catalyzing Change*.  How can teachers learn to help students fill in the gaps?  Include more examples and video exemplars for SMPs.  Flip the idea that we teach the SMPs using the content standards. |
| Judy Kysh | San Francisco State University | There are too many standards included in sections at the high school level. It reflects a misunderstanding that content is more important than the practices. The framework committee should find that balance.  There is demand for acceleration, but it is misguided. Math is not necessarily hierarchical or logical as it progresses. We need to learn more about the ladder of mathematics we will climb. The framework should be focused on depth. |
| Kirsten Sarginger | Santa Clara County Office of Education | I like chapters by grade and course, and emphasis on UDL. Instructional delivery models need enhancing. I want to see students with learning disabilities have robust content and support should be embedded (not in a separate chapter). Mindset should be addressed, including mastery learning. This will help overcome time-bound assessment and instruction that creates holes in student learning. Include STEAM. |
| Yvonne Park | Santa Clara Unified School District | We didn’t have time to use the framework in a meaningful way. Now we are focusing on essential standards (especially for high school). K–8 standards are strong; high school are way too dense. I want to address newcomers with no English or no education. We have students at high grades that are mainstreamed into math classes. We need strategies and pathways for how to serve these students, both linguistically and mathematically.  It would be wonderful for parents to access the framework and learn about what is being done in mathematics. |

### Fresno County Office of Education (connected by video conference)

| Name | Affiliation | Summary of Comments |
| --- | --- | --- |
| Karl Draper | CPM Educational Program | Thank you to the focus group members. I would like to see support for administrators. From experience, I know that teachers change when they are supported by leaders. Include problem solving strategies and how administrators can get good teachers to clarify their understanding. |

### Focus Group 4: August 26, 2019 Baldwin Park Unified School District

#### Focus Group Members Present:

| Member Name | Employer |
| --- | --- |
| Lena Bradshaw | ABC Unified School District |
| Tanja Brosche | William S. Hart Union High School District |
| Isabella (Lisa) Hoegerman | Apple Valley Unified School District |
| Jacqueline Booker | Los Angeles County Office of Education |
| Melanie Doody | Glendale Unified School District |
| Desiree Olivas | Santa Ana Unified School District |
| Richard Bramer | Kern High School District |
| Shawn Goehring | Upland Unified School District |
| Traci Waller-Lewin | Magnolia Public Schools |
| Ivonne Torres | Montebello Unified School District |
| Julie Prater | Oxnard Unified School District |
| Myra Deister | Fullerton Joint Union High School District |

#### Focus Group Discussion Notes:

**Question 1:**

What are the strengths of the *2013 Mathematics Framework for California Public Schools, Kindergarten Through Grade Twelve* (*Mathematics Framework*) that you feel should remain in the revised version?

* We value the paragraphs dedicated to the essential learnings.
* We appreciate the cautions around acceleration that come at the end of the sixth- and eighth-grade chapters.
* Keep the explanation examples by grade of the Standards for Mathematical Practices (SMPs), the examples of problems and strategies at each grade level and for each domain, and any connections drawn or made from previous/upcoming grade levels.
* The table for developing mathematical thinking, labeled “OB 3,” is really helpful.
* Continue to include examples of student misconceptions.
* Maintain the strength in the vertical alignment.
* Highlight major clusters.
* Keep the breakdown of eight math practices.
* The grade-by-grade breakdown of the topics to be covered is great.
* Each chapter’s first tables (labeled “1-1, 2-1,” and so on), which go all the way through eighth grade called the grade cluster level emphasis, are awesome.
* Keep the exemplars to support the explanation of the content standards.
* The symbols that indicate the importance of the meaning of the standards (ex., the triangles and the stars) are very helpful.
* The examples of concrete manipulatives are awesome.
* The multiple approaches to solving a problem are terrific.
* The statistics section contained a lot of good examples that should remain.
* I like the progression chart for K–8. It should bear some connection to, or be included with content, in chapters for the secondary level.
* The chart on page 25 showing progressions was good.
* I love that the framework is accessible online and includes live links.
* Keep the descriptions of SMPs and how they tie to grade-level standards, and also how they look at each grade level for both teachers and students.
* I like that the framework focuses on deeper dives into the content.
* Post-high school areas include sections and groups of skills that aren’t listed in the classes. Those are good descriptions.
* Teachers would appreciate a hardcopy.

**Question 2:**

Implementation of the *California Common Core State Standards* (CA CCSSM) *for Mathematics* has been varied across the state. What changes to the 2013 *Mathematics Framework* would better support local education agencies and teachers as they implement both the content standards and the standards for mathematical practice?

* Outline a granular-level approach to the standards. Split the presentation of the standards to create sub standards, perhaps, to make it a more effective document.
* Don’t break the content standards down further; instead, provide additional examples to enhance understanding that comes from reading them.
* High school chapters are vague and broad and need further specification.
* The math practices are laid out in a sample table, but there should be a narrative within the document so that it’s not separate.
* Tag the SMPs and include a pop-out with sample problems.
* The progression document on page 25 is laid out for K–8, but it goes to conceptual categories for high school. It should continue for both traditional and integrated pathways.
* Put the instructional strategies content in the front of the document.
* The instructional strategies section needs to grow.
* The section on UDL should include more examples.
* Capitalize on the changes in technology since the previous framework.
* Create and provide a hardcopy accompanying document to support framework use. It should include the grade cluster level, emphasis tables, subject/grade overviews, resources from the Universal Access chapters, and links to the state’s assessments.
* Develop tables for higher mathematics subjects and their cluster level emphasis, just like those provided for lower levels.
* Provide CAASPP and Scholastic Aptitude Test (SAT) questions and tie together instruction and assessment.
* Do more to highlight common misconceptions and anticipation of errors.
* Provide more clarity around content in high school.
* Reference updated research, specifically around the effectiveness of student-centered learning. Include data that users can cite to support change or orchestrate professional learning.
* I'd like to see more teacher moves that are effective in generating student thinking included in the framework.
* Grade seven, Geometry standard six, includes awkward wording in the standard. For these kinds of complex standards, there needs to be narrative around these to facilitate understanding.
* An example for 6EE 2C on the top of page 307 needs to be revised because it includes a “-2” for the variable “N,” but the students don’t learn to do operations with integers until the following year.
* Math 8 and Integrated Math overlap. Include a recommendation in the framework that students should notskip the foundational, conceptual understanding that happens in the Math 8 standards and builds into Integrated I.
* The instructional materials chapter needs to further specify the process for materials in nine–twelve.
* The framework needs guidance on how to develop mathematical academic language.
* Caution about implementation in a way that calls out the long ramp-up to standards.
* The framework should be a live document with a social media presence and mobile access.
* Can we cross out or redact parts of standards that do not apply to specific courses when they are used in examples? Teaching would benefit from the clarification, much like is included in some brackets.
* The plus standards for high school math are not solely restricted to Pre-Calculus. When they appear in the other courses, are they considered extra? Are they only for honors classes? They are very confusing and should be clarified.

**Question 3:**

How can the revised *Mathematics Framework* better support access to the standards-based curriculum for all students, including English learners, students with disabilities, gifted students, and other groups of students with special needs?

* Provide more low-floor, high-ceiling activities.
* Include links to different level questions that serve as examples that teachers can use to support standards from easy to difficult.
* The universal access chapter could speak to the ways a slower pace influences student learning. Modify the framework to support students who are not able to meet the expectations of lower levels of experience.
* Provide examples of problems that include multiple points of entry, and problems with endless solutions.
* The framework should show examples of what good teaching looks like.
* Teaching vocabulary should be embedded in grade-level prompts and become a clear part of teaching math.
* Incorporate and specifically call out the ELA/ELD and science content standards in the math examples.
* Provide examples for how to enrich and expand learning at a grade level (rather than advance to the next grade level).
* The framework should clarify how teachers can more effectively address large gaps in learning.
* Include productive and unproductive beliefs about math education, as cited in *Principles to Action*.
* The universal access chapter should have separate sections dedicated to EL students and students with Individualized Education Plans (IEPs), 504s, and disabilities, even if the result is that material is repeated in these separate sections.
* The framework must reinforce the value of students asking and answering each other questions.
* There should be a chapter on pedagogy to help teachers move kids to proficiency (not necessarily accelerate to the next grade level).
* There’s a lot of text in the universal access chapter, yet too few examples.
* Course plans for acceleration should address how to *teach* gifted students rather than how to accelerate them.
* The high school examples that move from concrete to broad should remain and include multiple points of the entry.
* Provide concrete strategies and sample lessons that break down ways to differentiate.
* Address how to approach different EL levels and special education students and enrichment pieces for gifted students.
* Clarify the plus standards, the direction with STEM, more on advanced courses, and enhance statistics. There should be emphasis for differentiation that includes what kind of teaching is more geared for STEM (in terms of Calculus) and which is geared for statistics or business Calculus.
* There should be more emphasis on concrete/representational/abstract models, not just within the chapters for instructional strategies, but maybe throughout the document.
* The complexity and connections to other discipline explanations in the universal access chapter should be more concrete. This includes information for administrators on the role of professional learning and the provision of specialized training specifically for administrators.
* Add links to videos for how to incorporate the universal access chapter in the classroom and lessons in the Digital Library.

**Question 4:**

Assessment of student progress is essential for student success. What specific supports would you include in the revised *Mathematics Framework* to provide more guidance on effective means of student assessment?

* There should be links or example item stems on the CAASPP.
* Five practices for orchestrating productive mathematics discussion are mentioned in the framework, but we need to bring out the idea that those can be used as formative assessment.
* Emphasize that not all feedback has to be oral or written, and not all students need to be assessed at the same time. Consider emphasizing the value of comments over letter grades on an assignment.
* The 90/80/70 scale for assessing is not always appropriate; consider encouraging the use of rubrics that describe and measure thinking.
* Add examples and links to diagnostic assessments and practical approaches to observing, tracking, noting to assess content knowledge and avoid creating gaps.
* Include practical examples of how teachers are observing, tracking, and responding to what their students are doing.
* Provide examples of the ways technology can support formative assessment.
* Design a skeleton version of a course (rather than the full version). For example, in a grade eight Algebra course, how does translate to credit earned in a similar high school class? How would a teacher assess it?
* Include best practices around the use of CAASPP practice tests and their use in instruction.
* Teachers know that the way CAASPP measures achievement is different than how educators choose to evaluate. The framework should speak to this so districts can focus efforts on moving toward standards-based grading.
* There should be stronger connections to standards-based tests, including the structure and how students can be familiar with the language and the structure. That will allow me to create instruction that better prepares students.
* Implement questions for the SMPs that teachers can ask the class that helps them facilitate discussion in the classroom.
* Provide example rubrics.

**Question 5:**

Finally, what other recommendations do you have to ensure that the revised *Mathematics Framework* is a useful tool for California’s educators?

* Create a framework-specific forum (online) for teachers to ask questions and engage with colleagues.
* Make concrete connections to other disciplines.
* Financial literacy standards are important and often ignored. Add them to course-level content.
* The Pre-Calculus chapter does not contain real-world examples. Include these, and expand the section.
* The topics from Partnership for 21st Century Learning, along with the 4 Cs, should be connected to the framework as a way to inspire creativity.
* The framework should dispel myths around 21st Century math.
* Administrators need a list to help them understand what to look for in a high-quality math class.
* Provide positive ways to increase LEA accountability and professional learning around the framework. There needs to be more local accountability.
* Math language needs a greater emphasis in the framework.
* Condense the integrated English and math practices examples; give us more math!
* Develop a framework app to make the document a teacher’s first stop.
* Graham Fletcher is a great resource to show the progression of the standards. Capture his work by using examples to promote responsive teaching and learning.
* Teachers should be involved in coursework and be aware of the progression (before and after) to better address gaps.
* Examples in the fifth- and sixth-grade chapters, standard 5MD 5B an 6G 2, include incorrect formulas for volume. It shows a lowercase “b” instead of a capital “B.”
* Elementary teachers need to see more concrete connections between math and other content areas.
* Add a chapter on pedagogy.
* The universal access chapter should include teaching objectives and IEP goals based on language from the SMPs.
* Math I kids are typically ninth graders. The examples need to include language that illustrates an understanding of this student group.
* Take a stronger stance on teaching strategies and pedagogy with regard to what *not* to do. More firmly suggest that we teach math slowly, with less memorization and more depth.
* Publishers often cater to more than one state. It creates a misunderstanding that a text labeled for CA “and more” means a teacher must account for this cover to cover, beyond the California standards.
* Address the threat that apps like Photo Math, or the *Slader* website, pose to quality instruction. Generally, speak to technology as it relates to the integrity of math.
* We need support around math language to address the state’s reading levels.
* The TK chapter was a strength for my district, but teachers need to see more guidance. Refer to resources like EngageNY (not just CAASPP) for curriculum and material.
* The framework should provide context for every California district to dedicate one employee to becoming familiar with the framework.
* We need resources that show how math is connected to other disciplines. At one time, Colorado Science Education Network had units for teaching math and science together. Marilyn Burns showed how to teach literature and mathematics.

#### Public Comments:

No Comments Received

## Written Comments

### Written Comments from San Diego County Focus Group Meeting:

Bruce Grip, California Mathematics Council, Public Comment

Mathematical Modeling

In 2013 the category of the Mathematical Modeling was unfamiliar to almost all teachers of mathematics. The Framework provided some background to support teachers’ understanding but it was buried in Appendix B.

It is my observation that mathematical modeling still does not happen in classrooms.

* Teachers still do not understand MM and how to incorporate in classroom instruction.
* Using “models” and “modeling mathematics” has been substituted for mathematical modeling; these good activities, along with an incomplete understanding of MM, keep students and teachers from experiencing the richness and benefits of MM.
* Starred standards give teachers the option of modeling without requiring. Most use of models are presented in activities designed to help students understanding mathematics and rarely, if ever, authentic connections to the real world.
* Modeling opportunities included in newer curricular materials are inadequate (stupid, silly, irrelevant, really?!) or relegated to an optional activity to culminate a unit of study.
* SBAC was supposed to provide assessment of, and accountability for, instruction incorporating mathematical modeling. SBAC performance tasks shifted from challenging real-life modeling problems to guided modeling. Instead of lowering expectations we need to step up instruction to provide students with mathematics they can use.

The destination for mathematics education has been, and continues to be, understanding mathematics and not learning and applying mathematics to solve problems that arise in everyday life and career. We now have available better resources and activities to help students understand mathematics conceptually. Few resources and opportunities exist for students to apply mathematics to life in the real world.

For the benefit of our students and their lives after school I would like to see mathematical modeling as a thread that weaves throughout all grade levels and concepts. Increase mathematical modeling examples at each grade level. Encourage a balance between understanding the system of mathematics, the beauty of mathematics, and the real-world uses of mathematics.

Revise and update Appendix B.

Be explicit about the differences between pure and applied mathematics and the need to provide a balance between the two including the resulting benefits.

Integrated High School Mathematics Curriculum

* In the high school pathways change the sequence in which the options are presented and begin with the integrated option first.
* Almost all new “integrated” high school mathematics curricula are merely a re-chunking of concept development as presented in a traditional sequence. Explore a three-year (four-year) truly integrated sequence of concepts and skills along with tasks/problems/projects that draw upon mathematics from multiple categories.

New Resources

* Build into the new CA Framework ideas of:
  + The TRU Framework
  + NCSM and TODO’s position papers on equity in math education
  + NCTM *Catalyzing Change in High School Mathematics*
  + NCTM *Principles to Action*
  + Jo Boaler’s work on *Mindset Mathematics*
  + Matt Larson’s *Balancing the Equation*
  + Danny Martin, Julia Aguirre, and Karen Mayfield-Ingram, *The Impact of Identity in K–8 Mathematics; Rethinking Equity-Based Practices*
  + Rachel Lambert’s perspective and resources for students with disabilities
  + Cathy Seeley’s *Faster Isn’t Smarter* and *Smarter Than You Think*

Miscellaneous Thoughts

* Make sure writers and facilitators actually listen and respond to the committee experts by actually incorporating group’s suggestions into each iteration.
* Continue the emphasis on progression thinking. Help teachers understand a key concept may be introduced informally/naturally in one grade level, explored and developed in the next and solidified/extended in the third year. “The bulk of instructional time should be given to ‘Major’ clusters and the standards within them. However, standards in the ‘Supporting’ and ‘Additional’ clusters should not be neglected.”
* Incorporate financial literacy into comprehensive high school curriculum.
* Continue to de-emphasize/discourage acceleration. Focus on depth of understanding and breadth of application.

Reference:

Grade 5, lines 387, 412

Grade 8, line 193, 292, 361, 622 (Solve real-world and mathematical problems…)

Math 1

### Written Comments from Sacramento County Focus Group Meeting:

Heidi Espindola, Placer County Office of Education, Public Comment

* More frequent and explicit connections to previous grade standards. As of now, they are infrequent and most are general introductions at the beginning of a domain or topic. If we are trying to expand our tier 1 instruction to provide access for all, we need to better understand the progression of concepts. (Maybe usage or mention of the coherence map might help?)
* More references to and variety in the type of concrete models students can engage with for concept development. This is especially true for high school where many teachers start with the abstract.
* MPs are currently referenced throughout (more in K–8 than HS), but teachers need more than “(MP.#)” next to a phrase. They need explicit language talking about how students are engaging in the MP within the activity they are describing. Elementary teachers are still having trouble bringing the MPs down from the conceptual to literal student actions and high school teachers are having trouble ensuring that required student actions are rigorous.
* The essential learning for the next grade should be more explicitly interwoven into each of the domain narrative, not just at the end of the framework chapter.
* More explicit connections to the science and ELA standards so that teachers can bundle learning objectives.
* There are “critical areas of instruction” delineated within K–8, but not high school. That is something desperately needed, particularly for IM1 or Algebra 1.
* More of a focus on quantitative reasoning and where that can be seen in the high school standards.
* Discussion of alternative HS pathways as we know not all students go through the entire integrated series and then Pre-Cal/Calculus! Nor do they need to for a vast majority of career paths!

### Written Comments from Santa Clara County Focus Group Meeting:

Responses below from Christine Roberts:

1. What are the strengths of the *2013 Mathematics Framework for California Public Schools: Kindergarten Through Grade Twelve* (*Mathematics Framework*) that you feel should remain in the revised version?

* Grade level chapters with grade-specific examples of the Standards for Mathematical Practice, sections for each domain with narrative explanations and example problems/tasks, grade-level standards.
* The two pathways for High School outlined so that teachers, schools, and districts can see how the standards are developed in each pathway.
* The Universal Access, Instructional Strategies, and Assessment chapters are three chapters in addition to the grade level chapters that I use often with teachers during on-going work and in professional learning sessions.

1. Implementation of the *California Common Core State Standards* (CA CCSSM) *for Mathematics* has been varied across the state. What changes to the 2013 *Mathematics Framework* would better support local education agencies and teachers as they implement both the content standards and the standards for mathematical practice?

* I think that more than changes to the framework, statewide support is needed to support teachers, leaders, and school/district systems in developing and deepening knowledge of the standards, instruction to promote problem solving and support productive struggle, and rich and rigorous tasks for all students. Ways that this can be achieved include:
  + Support for professional learning sessions throughout the state that deepen and extend current knowledge of teachers (Something like SB 472 designed thoughtfully for the range of knowledge and levels of implementation throughout the state).
  + Lessons learned from schools and districts throughout the state that have demonstrated focused long-term efforts to implement the standards.
  + Continued and expanded support for lesson study efforts across the state to provide professional learning opportunities in real-time with students.

1. How can the revised *Mathematics Framework* better support access to the standards-based curriculum for all students, including English learners, students with disabilities, gifted students, and other groups of students with special needs?

* Particular focus and additional work should be done to align the Universal Access chapter with information regarding the CA ELD standards.
  + Since these standards were released after the initial CA Mathematics Framework, updates should be made to include the ELD standards (both Part 1 and Part 2), research based strategies to support English Learners in math, ELD + Math Snapshots (the ELA-ELD framework has several), ELD + Math Vignettes (none in the current ELA-ELD framework, but I emailed 2 samples that I created for our work with districts).
  + Also, the Language Routines (<https://ell.stanford.edu/sites/default/files/u6232/ULSCALE_ToA_Principles_MLRs__Final_v2.0_030217.pdf>) from Stanford’s Understanding Language should be included with examples.
* For students with disabilities, we need to expand the Framework’s recommendations and examples. In my work, I often see high levels of remediation for SWD, perhaps creating further disparities. I would recommend consulting with Rachel Lambert, at UC Santa Barbara and <https://mathematizing4all.com/> to revise this section.

1. Assessment of student progress is essential for student success. What specific supports would you include in the revised *Mathematics Framework* to provide more guidance on effective means of student assessment?

* We use the SBAC Item Specifications with teachers utilizing the Achievement Level Descriptors and Task Models. These components help teachers to understand the full depth of the standards and see rigor in the items. We have seen increased alignment with Curriculum - Instruction - Alignment. These previously only existed for testing grade levels; however, the CCSSO recently released the [Performance Level Descriptors for K-2](https://ccsso.org/resource-library/performance-level-descriptors-pld-grades-k-2-mathematics) (<https://ccsso.org/resource-library/performance-level-descriptors-pld-grades-k-2-mathematics>), which would create a nice unifying approach to using the ALDs/PLDs to support rigorous and aligned instruction.

1. Finally, what other recommendations do you have to ensure that the revised *Mathematics Framework* is a useful tool for California’s educators?

* Mindset - A chapter dedicated to mindset and ways to develop a growth mindset with students would be helpful. This should also include existing practices and processes/systems that detract from this work or reinforce math myths still prevail despite research and evidence otherwise.
* Tracking/acceleration needs to be addressed more explicitly than simply the maps about possible pathways in the back. Despite the evidence, too many districts are continuing this practice, placing an artificial limit on what and who can learn mathematics. This is both a statewide achievement issue and an equity issue.
* The cluster headings should have their capital letter in front of them. It creates an extra challenge to explain what 5.NBT.A is when it could simply be added to the standards list. This would do several things: 1) it would help to call out that the clusters are important and not to be ignored, 2) it would align with testing and task resources that identify the cluster heading, and 3) it would add clarity to the naming and use of standards.

### Written Comments from Baldwin Park Focus Group Meeting:

No Written Comments Received

## Appendix A

### Cited Research and Resources

A list of resources and research cited in oral and written comments:

1. “Preparing 21st Century Students for a Global Society: An Educator’s Guide to the ‘Four Cs’”

National Education Association guide for the “Four Cs” in classroom practices.

1. National Council of Teachers of Mathematics, <https://www.nctm.org/>.
2. California Standards for the Teaching Profession, <https://www.ctc.ca.gov/docs/default-source/educator-prep/standards/cstp-2009.pdf>
3. Park City Mathematics Institute, <https://www.ias.edu/pcmi>.
4. Howard County, <https://hcpss.instructure.com/courses/106/pages/standards-for-mathematical-practice>
5. Granite School District, <https://www.graniteschools.org/mathvocabulary/vocabulary-cards/>.
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## Appendix B

### Student Focus Group Input Report Pilot

In September and October, members of the CDE conducted focus group discussions with students in grade two, four, seven, eight, and twelve at four school sites in Sacramento County. The purpose of the student focus groups was to collect input from students concerning their experiences with and opinion about mathematics instruction. The focus groups were facilitated discussions based on the following questions:

1. What does it mean to you to be good at math? When you do those things, does that mean you are successful in math?
2. What factors contribute to your success or lack of success in math class?
3. Do you like math class? What do you like about it? Are there any things that you do not like about math?
4. Think about your math classes. What are some things that teachers do that help you learn new math ideas? Tell about a time when you did not feel successful in math. What could teachers do to help you be more successful?
5. Do you play games or use tablets/computers to help you learn math? Tell me about those things and how they help.

At some of the groups the facilitators added or clarified the questions based upon the needs of the students. To some degree, the content of the student responses has been summarized.

### Student Focus Group 1

Grade Two (22 students)

September 30, 2019

**Question 1:**

What does it mean to you to be good at math? When you do those things, does that mean you are successful in math? (Students were then asked,“but what does it mean to be good at math specifically?”)

* It means to pay attention, follow directions.
* Never give up.
* Do your best.
* Face challenges.
* Believe in yourself.
* Listen to what the teacher is saying.

**Question 2:**

What factors contribute to your success or lack of success in math class?

* Never give up.
* Just keep trying and do what the teacher says because the teacher helps you learn more.
* (Use a) ruler for helping you with measuring.

**Question 3:**

Do you like math class? What do you like about it?

* Like the challenging questions.
* Sometimes it’s hard; sometimes it easy.
* It helps you get better when you do strong things.
* We can get better at it.
* Math makes you smart (proves you’re smart).
* I like the activities we do (coloring).

Are there any things that you do not like about math?

* Too many questions and that is not fun.
* Sometimes it’s hard without help.
* Sometimes you get bad grades.
* Lots to read.

**Question 4:**

Think about your math classes. What are some things that teachers do that help you learn new math ideas?

* They help us by coming to us and reframing the questions.
* Mistakes help me learn.
* By trying different answers (I develop perseverance).
* Teachers show you how to do things that you could not do before.

**Question 5:**

Tell about a time when you did not feel successful in math. What could teachers do to help you be more successful? (Clarification from the moderator. How do you get past being stuck?)

* Teachers come to you when you raise your hand.
* Sometimes we can help our friends. They read stuff with us. This gives us confidence to keep trying.
* Teachers work with us one-on-one.
* Teachers write on the board.

**Question 6:**

Do you play games or use tablets/computers to help you learn math? Tell me about those things and how they help.

* Use calculator.
* Use district math programs, math app on the computer.
* *iReady* (computer math program)

### Student Focus Group 2

High School Grade Twelve (two classes of 25 students each)

October 3, 2019

**Question 1:**

What does it mean to you to be good at math? When you do those things, does that mean you are successful in math?

* The ability to answer questions.
* The ability to understand what you are doing in math.
* Being able to build upon past knowledge.
* Gaps make it hard to be successful.
* Teachers are key to help you be successful.
* Teachers who make it interesting and are not monotone.
* Teachers who are available can contribute to your success.
* Teachers who make it okay to make mistakes help. Those who care more about you learning than you being right are better.
* Getting corrected work back helps me determine if I actually learned the material.
* Teachers who allow us to retake tests. Some students won’t try [the first time] if they know they get a second chance, but if I can have a second try to get it I feel more successful and like that I am actually learning the material. This is a great incentive.

**Question 2:**

Do you like math class? What do you like about it? Are there any things that you do not like about math?

* We like it when we feel successful, like when there was a set answer.
* We preferred classes where there are clear answers.
* Didn’t like math since I failed it.
* If you’re not taught correctly you are not successful.
* Math is hard if you have to build on prior knowledge and there are gaps.
* I like when I have success and dislike it when I don’t have success.
* A better incentive is to understand when it is relevant and applies to the real world.
* When you have to learn concepts but can’t explain why we need to know it, there is a disincentive to learning.
* When it is not taught well it is demotivating.

**Question 3**

What factors contribute to your success or lack of success in math class?

* Write notes with the class not before, be interactive. If teachers put notes on the board without explaining them, students are confused and have no context for the new information, which leads to confusion. Prefer teachers to do notes with examples as they teach the concepts.
* When all classes take the test on the same date whether you are ready or not. This takes away from enjoyment.
* Teachers who make math lessons interactive make the environment less intimidating.
* Teachers who want to be there and enjoy the work it makes you enjoy it. When teachers want to help it makes you want to work.
* Room lighting—no dark rooms! It makes me tired. Its better when it’s light and airy.
* Re-teaching lessons is important because you get to build upon prior knowledge. If you don’t get it the first time, it’s hard to be successful in the future because you have gaps.
* Grading homework and be able to get points. I have had classes where homework was graded not just for effort and I was able to make corrections for more points and it intensified my learning.
* When teachers write notes beforehand and you have to copy frantically as the teacher is doing the work and explaining you can’t pay attention to the teaching and it is less efficient.
* Walk through the steps and staying on one topic. Building upon past knowledge.
* Go over variations of problems and having more than one look at the concept helps with advanced problems.

**Question 4**

Think about your math classes. What are some things that teachers do that help you learn new math ideas? Tell about a time when you did not feel successful in math. What could teachers do to help you be more successful?

* Teachers being available before and after school.
* Use real life problems to make it relevant.
* I feel dumb when teachers go too fast, or making fun of you it doesn’t stick.
* Real life, practical, real world math—know when I’m going to use this.
* I learn better on my second try. When teachers allow us multiple times. It really helps me put in the effort.
* It is hard when teachers poll the class for understanding, “Are you getting this?” and move on when only a few students say yes.
* Wish I could use notes on tests to help alleviate stress. It’s hard to memorize formulas. It adds stress.
* Need to have a classroom environment that is comfortable and an approachable teacher.
* Have groups of four to help learn–collaborative work helps me be successful and not be embarrassed to ask questions.

**Question 5**

Do you use technology to help with math?

* *KenKen* game for basic facts.
* Mental math techniques and games in class help.
* “Daily 2” math warm-up activity.
* *Sumdog* activities when in middle school/elementary.
* Using technology has resulted in limited success because being on a computer can be distracting (want to use other programs or apps instead).
* Khan Academy is effective in helping to learn or reinforce new concepts.

**Question 6**

**What else do you want us to know about math instruction?**

* Don’t force all teachers to be on the same schedule.
* Some teachers use a pre-test that, if you pass, means you do not have to take the scheduled test. If you do poorly then you get a re-take, and that is a good thing.
* Integrated Math system and curriculum can be confusing for the students and the teachers.

**Question 7**

How can we help make Integrated Math better?

* Use notes from the textbook in a way that makes things correlate.
* Integrated Math gives you a chance to move on from concepts you are struggling with and learn new information and feel successful.
* Jumping all over the place and a set pace are hard to follow.
* Need to have more time with skilled instructors to avoid having to teach myself things I don’t understand.
* Seems to be formulated for one person with no leeway for variation. Integrated Math is one size fits all but we are not. I would prefer to learn at my own pace.
* Teachers are the make-or-break in the equation: when the math teacher is passionate it makes the difference.

### Student Focus Group 3

Elementary School Grade Four (23 students)

October 3, 2019

**Question 1**

What does it mean to you to be good at math? When you do those things, does that mean you are successful in math?

* Knowing quick at math facts. It can help you do more things.
* Memorize multiplication and division facts.
* You have to understand and be able to show understanding (like draw pictures).
* Show your work.
* Success: a destination later life not an intermediate destination. The information learned now will be used for future purposes. There is always something to learn. Success means a achieving a good job as an adult [as a result of doing well in math class now].

What helps your success in math class?

* Use of tools (counters, place value blocks, and calculator).
* Pictures and charts around the classroom.
* Teacher interaction and guidance.
* Asking lots of questions.
* Tests help because you can use the questions you get wrong to help you learn.
* Book help because they help you to read.

**Question 2**

What factors contribute to your success or lack of success in math class?

* My teachers lets me draw pictures.
* I like making mistakes. When I mess up I learn the right answer, then it helps me.
* Being successful helps me learn more. It helps me solve problems.
* Math is not fun if it is not challenging.
* Too much math makes me tired, then I get confused and unfocused.
* I like the struggle because it make me smarter, then I can figure out the new problems faster.
* I like math because it’s useful.
* Sometimes I don’t like it because it puts pressure on me and that’s not fun and tests make me struggle.

**Question 3**

Do you like math class? What do you like about it? Are there any things that you do not like about math?

* Use relevant real life examples to increase my interest.
* Naptime before or after math.
* Give a break in the middle of lesson.
* Make it fun.
* Ask teachers questions so the teacher can help.
* Add color to the activities.
* Make stories to make it more fun.
* If you cut out things like in Kindergarten.
* Do things that we are interested in.
* Have breaks.

**Question 4**

Think about your math classes. What are some things that teachers do that help you learn new math ideas?

* Work with peers.
* Teach the content more often.
* Explain in multiple ways and give more time.
* Pull some small groups.
* Have extra websites.
* Be attentive while students are working.
* Have a spiral review so we don’t forget topics.
* Use music and songs.
* Have good classroom management.

**Question 5**

Do you use technology or games do you use to help with math?

* *Prodigy* is a fun math game that has math.
* *iReady* to help students who don’t get.

**Question 6**

Is there anything else that helps you learn?

* Classroom management–when the teacher makes everyone be quiet and listen.
* Classmates talking and distracting makes it harder, so our teacher uses calming music to keep us quiet and focused.
* Number Talks help us to learn the material better.

### Student Focus Group 4

Middle School Grades Seven and Eight, combined (12 students)

October 9, 2019

**Question 1**

What does it mean to you to be good at math? When you do those things, does that mean you are successful in math?

* You understand and are confident.
* You understand how to do the problem.
* You understand why you do it and can explain to others.
* You get the learning target.
* Being able to show that you understand and can articulate or write it.
* Success equals the bare minimum, not necessarily understanding.
* Know not just the how, but the why.

**Question 2**

Thinking back to the time that you were unsuccessful in math class, what actions or support by the teachers do you think would have helped you to be successful?

* Make up songs.
* Explain how to solve the problem posed in the learning target.
* Take notes.
* Relate it to real world problems.
* Use flash cards.
* Explain “the what” and “the why” when giving instruction.

**Question 3**

Do you like math class? What do you like about it? Are there any things that you do not like about math?

* Help with curiosity.
* Challenges your brain.
* Gets you to think—I just like thinking about things.
* You can use it for everything.
* Gives me a chance to hear others think and solve problems.
* Math is a tool.
* It will help in the future, and it helps to figure out things.
* Don’t like the writing. It can be too complex and it becomes boring.
* Study at home.
* Ask a classmate.
* Ask friends for notes.
* Research it on the internet.
* Check notes.
* Switch it up, do things differently
* Look for other resources.

**Question 4**

Think about your math classes. What are some things that teachers do that help you learn new math ideas?

* Use real examples.
* Error analysis—help us see what we did wrong and how to fix it.
* Reteach the ideas again in another way.
* Drill it into our minds with songs and chants.
* Show how you were supposed to do it.

What are your feelings about mistakes?

* Helps me learn what I did wrong
* I feel frustration and ask for help
* Skip to other problems then use the process from those to help with the previous problem
* I am frustrated when I don’t get the process, not so much if I make a calculation error.
* I get embarrassed if I make a public mistake.

**Question 5**

What type of digital resources help you to learn math most effectively? Why do you think that is?

* *Prodigy*
* School website, *MSchool Math*
* Find songs that help.
* *Skyrim* requires the use of math skills.

**Question 6**

Anything else that would help you to do better at math?

* Videos help, because they are memorable.
* Grade on understanding more than on correct answers.
* Physical breaks.
* Step-by-step instructions.
* Use a randomizer.
* Knowing what is expected and having the opportunity to see the work before and after (the information on the teacher’s own website is helpful).
* Use math games.

**Question 7**

Think of a time when you were struggling and then you got it, what made a difference, the “a-ha” moment?

* Compare teacher’s examples with what I did to see my mistake.
* Teaching/ explaining the problem to another student helps make sure we both understand.
* Teacher pointing out the mistakes helps me to see what I missed.
* Practicing the algorithm, find a pattern, and applying it to my new situation.
* Go from the answer to the problem. Once I have the answer I can go backwards to find out what I did and how the answer makes sense.
* Learn the missing piece.