



Expert Panel Meeting
Public Meeting

California Department of
Education

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California English Language
Development Standards,
Common Core State
Standards for Mathematics,
and Next Generation Science
Standards:

Correspondence Study and
Sample Augmentation
Document

WestEd Leads

English Language Development

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Mathematics

- Cathy Carroll

Science

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Previous Correspondence Studies Consulted



ELPD Framework

The Framework for English Language Proficiency Development Standards Corresponding to the Common Core State Standards and Next Generation Science Standards (CCSSO, 2012)

ELPA 21 Consortium ELP Standards

English language proficiency standards with correspondences to K–12 English language arts (ELA), mathematics, and science practices, K–12 ELA standards, and 6–12 literacy standards (CCSSO, 2013)

English Language Development Materials Consulted

California ELD Standards

- ELD Proficiency Level Descriptors (Chapter 2)
- Grade-level Standards (Chapter 3)
- Learning About How English Works (Chapter 5)

California English Language Arts/English Language Development Framework

Mathematics Materials Consulted

CA CCSS for Mathematics

Standards for Mathematical Practice: Commentary and Elaborations for K–5 (Illustrative Mathematics, 2014)

Standards for Mathematical Practice: Commentary and Elaborations for 6–8 (Illustrative Mathematics, 2014)

Mathematics Framework for California Public Schools: Kindergarten Through Twelfth Grade

Science Materials Consulted

***Next Generation Science Standards for California Public Schools,
Kindergarten through Grade Twelve***

***A Framework for K–12 Science Education: Practices, Crosscutting
Concepts, and Core Ideas (Committee on Conceptual Framework for
the New K–12 Science Education Standards; National Research
Council, 2012)***



Level of Analysis

ELD Standards

Part I: Interacting in Meaningful Ways

A. Collaborative

Engagement in dialogue with others

B. Interpretive

Comprehension and analysis of written and spoken texts

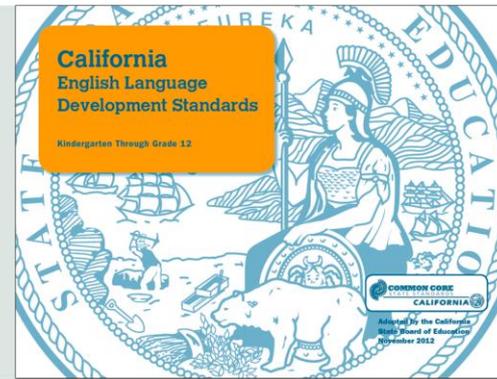
C. Productive

Creation of oral presentations and written texts

Part II: Learning About How English Works

Why Establish Correspondence using CA ELD Standards Part I?

How do CA ELD standards Part II relate?



- Part I language uses *directly* correspond to math and science & engineering practices
 - Explicitly described and identifiable in academic content standards
- Part II language structures *apply across* uses described in Part I
 - Not designed or intended to be implemented in isolation of Part I
 - No explicit equivalents in math and science content standards or practices
- Correspondence of Part I to language demands of math and science standards *involves & implicitly represents* correspondence to Part II
 - Augmentation document will make explicit the correspondence to Parts I & II

Level of Analysis

Mathematics Standards

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Sample Standards for each grade level K–8 and high school

Key Mathematical Practices Involving Extensive Language Use

Structuring the Standards for Mathematical Practice¹

**Overarching habits of mind of
a productive mathematical thinker**

1. Make sense of problems and persevere in solving them.
6. Attend to precision.

2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.

Reasoning and explaining

4. Model with mathematics.
5. Use appropriate tools strategically.

Modeling and using tools

7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Seeing structure and generalizing

Sample Mathematics Rating

Grade 7

ELD.PI.7.6b.Br. Reading/viewing closely

Express inferences and conclusions drawn based on close reading of grade-level texts and viewing of multimedia using a variety of precise academic verbs (e.g., *indicates that, influences*).

Sample Mathematics Standard

7.G.3 Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Sample Mathematics Rating, con't.

Grade 7

1. Make sense of problems and persevere in solving them.

Mathematically proficient students:

- Explain correspondences between equations, verbal descriptions, tables, and graphs.

6. Attend to precision.

Mathematically proficient students:

- Try to communicate precisely to others.
- Try to use clear definitions in discussion with others and in their own reasoning.

Clarifying Questions



Level of Analysis

Science Standards

Performance Expectations

- ❖ Science and Engineering Practices
- ❖ Disciplinary Core Ideas
- ❖ Crosscutting Concepts

Connections to ELA/Literacy

Level of Analysis

Science Standards

Science and Engineering Practices

1. Ask questions and define problems.
2. Develop and use models.
3. Plan and carry out investigations.
4. Analyze and interpret data.
5. Use mathematics and computational thinking.
6. Construct explanations and design solutions.
7. Engage in argument from evidence.
8. Obtain, evaluate, and communicate information.

Extensive Language Use in Science & Engineering Practices

Engagement in practices is language intensive and requires students to participate in classroom science discourse. The practices offer rich opportunities and demands for language learning while advancing science learning for all students (Lee, Quinn, & Valdés, in press). English language learners, students with disabilities that involve language processing, students with limited literacy development, and students who are speakers of social or regional varieties of English that are generally referred to as “non-Standard English” stand to gain from **science learning that involves language-intensive scientific and engineering practices.** When supported appropriately, these students are capable of learning science through their emerging language and comprehending and **carrying out sophisticated language functions (e.g., arguing from evidence, providing explanations, developing models)** using less-than-perfect English. **By engaging in such practices, moreover, they simultaneously build on their understanding of science and their language proficiency (i.e., capacity to do more with language).**

Sample Science Rating

Grade 7

ELD.PI.7.6b.Br. Reading/viewing closely

Express inferences and conclusions drawn based on close reading of grade-level texts and viewing of multimedia using a variety of precise academic verbs (e.g., *indicates that, influences*).

One of several corresponding Performance Expectations:

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

Sample Science Rating, con't.

Grade 7

Practice 8: Obtaining, Evaluating, and Communicating Information

Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.

- Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.

Clarifying Questions





Analysis Protocols

Content Review

- ✧ Training and Calibration
- ✧ Correspondence Rating
- ✧ Analysis and Ongoing Calibration

ELD Review

- ✧ Calibration
- ✧ Analysis and Ongoing Calibration

Overall Results



The CA ELD Standards address the full range and rigor of language demands required by the:

- CA CCSSM across all grade levels, as represented in the standards for mathematical practice; and
- CA NGSS across all grade levels, as represented in the science and engineering practices and the performance expectations.

Recommended Augmentation of ELD Standards

Provide examples of application of particular ELD standards in the context of mathematics or science instruction

Example:

ELD.PI.4.3.Br. Offering Opinions

Negotiate with or persuade others in conversations using a variety of learned phrases (e.g., *That's a good idea. However . . .*), as well as open responses, in order to gain and/or hold the floor, provide counterarguments, elaborate on an idea, and so on.

Recommended Augmentation of ELD Standards

ELD

Offering Opinions

Mathematics

In making mathematical arguments and critiquing the reasoning of others, students need to connect and/or counter others' ideas with mathematical justification. EL students need to learn the precise and appropriate vocabulary, sentence formulations, and discourse patterns to actively engage in these kinds of interactions in the math classroom.

Recommended Augmentation of ELD Standards

ELD

Offering Opinions

Science

In science and engineering, EL students participate in collaborative conversations where they engage in argument from evidence. During these conversations, they construct arguments and support them with reasons and evidence, and they critique the scientific methodology, and explanations or solutions proposed by their peers by citing relevant evidence. In order to persuade others that their arguments are reasonable and supported by evidence, gain and/or hold the floor, provide counterarguments, or elaborate on a peer's idea, students learn to use language in ways that enable them to achieve these purposes in respectful and productive—and increasingly academic—ways.

Recommended Augmentation of ELD Standards

Make *explicit* the application of ELD standards that are *implicit* in the mathematics and science standards

Example:

ELD.PII.4.6.Br. Connecting Ideas

Combine clauses in a wide variety of ways (e.g., creating complex sentences using a variety of subordinate conjunctions) to make connections between and join ideas, for example, to express cause/effect (e.g., *Since the lion was at the waterhole, the deer ran away*), to make a concession, or to link two ideas that happen at the same time (e.g., *The cubs played while their mother hunted*).

Recommended Augmentation of ELD Standards

ELD

Connecting Ideas

Mathematics

When explaining their thinking or listening to/reading the explanations or arguments of others, students need to understand how ideas are connected and condensed.

For example, when explaining how they solved a problem using multiplication and fractions (4.NF.3d), a student needs to connect the ideas "This is 8 feet of wrapping paper," "That's the total amount of wrapping paper altogether," and "They have enough wrapping paper to do their packaging." These connected ideas are expressed in mathematics contexts as: "Altogether, this is 8 feet of wrapping paper, which means they have enough to do their packaging."

Recommended Augmentation of ELD Standards

ELD

Connecting Ideas

Science

When explaining their thinking or listening to/reading the explanations or arguments of others, students need to understand how ideas are connected and condensed.

For example, as students provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents, students' discourse surrounding their investigations with circuits and building a model to make a doorbell ring (4-PS3-2) may include combining clauses in the following ways:

- “The doorbell did not ring, even though the switch was closed.”
- “When we connect all the wires, the battery, the switch and the bell, then it rings.”

Questions & Discussion