Science Is Coming to the California Dashboard

What Administrators, School Leaders, Assessment Coordinators, and Data Analysts Need to Know

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Accountability systems play a crucial role in state educational frameworks, providing insights into how schools and local educational agencies (LEAs) are meeting the needs of their students. California's accountability system integrates accountability and continuous improvement, and it is designed to meet state (Local Control Funding Formula—LCFF) and federal (Every Student Succeeds Act—ESSA) requirements. The accountability system includes multiple state measures (i.e., academic performance, English learner progress, graduation rates, college and career, chronic absenteeism, suspension rates) as well as local measures reported through the California School Dashboard (Dashboard).

Now, the state is making a significant change to its accountability system. Beginning with the release of the 2025 Dashboard, anticipated in November 2025, student performance data from the California Science Test (CAST) and the California Alternate Assessment (CAA) for Science will be incorporated as an accountability indicator alongside existing performance data for English language arts and literacy (ELA) and mathematics. (In this brief, the term

"CAST" includes the CAA for Science, except where noted.) This addition highlights the importance of science education in our increasingly technological world. As an administrator, school leader, assessment coordinator, or data analyst involved in data analysis and decision-making, understanding how to interpret and use these new data is vital for supporting and improving science education in your school or LEA. This brief aims to equip you with the knowledge you need to carry out this critical role.

In this brief, we will explore

- what the CAST measures and how it differs from other assessments,
- how CAST data may be presented—on the Dashboard and beyond, and
- strategies for interpreting and using CAST data effectively—with considerations for analysis of this new information.

What the CAST Measures and How It Differs From Other Assessments

What the CAST Measures

The CAST is aligned with the California Next Generation Science Standards (CA NGSS), the state science standards adopted in 2013. The CA NGSS consist of performance expectations (PEs) that describe what students are expected to know and be able to do by the end of each academic year from kindergarten through high school. The CA NGSS contains PEs in three main science domains at each grade level (elementary) or grade band (middle school and high school): physical sciences, life science, and earth and space sciences. A fourth domain—engineering, technology, and the applications of science—has PEs in each of the CA NGSS grade bands (kindergarten–grade 2, grades 3–5, middle school, and high school). The PEs are multi-

dimensional, consisting of science and engineering practices (SEPs), disciplinary core ideas (DCIs), and crosscutting concepts (CCCs).

The CAST summative assessments are designed to measure what students know and can do in relation to the CA NGSS PEs. These assessments are part of the California Assessment of Student Performance and Progress (CAASPP), which includes the Smarter Balanced ELA and mathematics assessments. Within the California accountability system, the CAASPP assessments are indicators of how well schools and LEAs across the state support students' academic learning in English language arts, mathematics, and now, science. Summative assessment results are included in accountability systems for at least two reasons: first, they are required by state (LCFF) and federal (ESSA) law as indicators of student performance in reading/language arts and mathematics; second, they provide standardized, comparable data on every student's performance statewide. Federal law requires only that science be assessed summatively (once in grades 3–5, once in grades 6–8, and once in high school), not that results be tied to accountability. California has proactively chosen to include science assessment results in its accountability system.

How the CAST Differs From the Smarter Balanced ELA and Mathematics Assessments

A key difference between the CAST and the Smarter Balanced summative assessments is in the grade levels in which the tests are administered. The CAST summative assessments are administered once in elementary school (at grade 5), once in middle school (at grade 8), and once in high school (at grade 10, 11, or 12; see the Science Test Administration for High School Students). These assessments measure students' science knowledge, skills, and abilities for the grade band (grades 3–5, middle school, and high school). For example, students in grade 5 are assessed on PEs from grades 3, 4, and 5. Students in grade 8 are assessed on the middle school PEs in each

domain, and students in high school are assessed on the high school PEs in each domain.

By contrast, the Smarter Balanced ELA and mathematics summative assessments are administered annually in grades 3–8 and 11. For grades 3–8, the assessments measure the standards taught over the same year in which the assessments are given. For example, students in grade 5 are assessed on the Grade 5 ELA and Mathematics Common Core state standards. The annual administration of ELA and mathematics assessments for grades 3–8 allows for yearly measurement of student progress. In science, comparing annual student progress is more challenging because the CAST summative is administered once in each grade band rather than once in each grade. Note that at grade 11, the Smarter Balanced summative assessments are more similar to the CAST summative taken in high school because the Smarter Balanced assessments measure content standards from the previous two years (grades 9 and 10) as well as the students' current year (grade 11).

Table 1 shows the grade levels in which CAST summative and Smarter Balanced ELA and mathematics summative assessments are administered.

Table 1. Administration of CAST Summative and Smarter Balanced Assessments by Grade Level

Grade	CAST Summative	Smarter Balanced: ELA	Smarter Balanced: Mathematics
3	No	Yes	Yes
4	No	Yes	Yes
5	Yes	Yes	Yes
6	No	Yes	Yes
7	No	Yes	Yes
8	Yes	Yes	Yes
9	No	No	No
10	Yes*	No	No

Grade	CAST Summative	Smarter Balanced: ELA	Smarter Balanced: Mathematics
11	Yes*	Yes	Yes
12	Yes*	No	No

Note: The CAST summative assessment is taken only once in high school in grade 10, 11, or 12.

How CAST Data May Be Presented—on the Dashboard and Beyond

CAST data will be presented on the Dashboard and additional state websites. There are a few important things to understand about the Dashboard data, including performance indicator data and what data are included for CAST.

Performance Indicator Data

The Dashboard shows ratings based on aggregate student performance at the school or LEA level. Performance on each indicator is represented by one of five colors ranging from red to blue, with red indicating the lowest performance and blue indicating the highest performance, as shown. (See How Colors are Determined to learn more.)

Source: California Department of Education, 2024

Each year, the indicator color is determined by two factors: 1) current year data and 2) how the current data compare to the previous year's data. Indicators are included for three main categories: Academic Performance, Academic Engagement, and Conditions and Climate. Each indicator can be viewed in greater detail by selecting "View More Details" at the bottom of the indicator.

Because CAST summative assessments are given once in each grade band, the data for an elementary school science performance indicator reflect only the tested students in grade 5; for middle school, the data reflect tested students in grade 8; and in high school, the data reflect students who took the CAST summative whether there were in grade 10, 11, or 12. As of November 2024, the State Board of Education has not adopted the precise cut points that determine how indicator colors for CAST performance will be calculated and displayed.

What Data Are Included for CAST

Dashboard data are aggregated at the school or LEA level and for each of the 14 specific student groups (i.e., racial and ethnic groups, English learner status, socioeconomic status, disability status, foster youth, and homeless students). LEA, school, and student group data must include a minimum of 11 students to have results reflected on the Dashboard. Groups must have data for at least 30 students to receive an indicator color. Since an indicator requires two years of data to show change over time, data for 30 or more students for the previous year and the current year are needed to have an indicator color. If data in one or both years for a particular group contained fewer than 30 students, the indicator color is gray. Note that for special education students, foster youth, homeless students, and long-term English learners, data for 15 or more students will receive an indicator color.

Additional CAST Data Beyond the Dashboard Indicators

Additional data for the CAST summative assessments can be accessed via links from the state DataQuest website or directly from the Test Results for California's Assessments page on the *CAASPP & ELPAC* (English Language Proficiency Assessments for California) website. On DataQuest, results can be accessed by selecting the level of data (e.g., state, county, LEA) and choosing "CAASPP Test Results" under "Assessment Data" in the subject field. CAST summative results may then be selected on the next screen.

Available data (from the 2018–19 academic year forward) include *Test Results At-a-Glance* and *Detailed Test Results*.

Test Results At-a-Glance. *Test Results At-a-Glance* includes the percentage of students within each achievement level for the grades in which the CAST summative is administered (5, 8, and high school) as well as the total percentage of students who met (Level 3) or exceeded (Level 4) the standard for science. As of November 2024, there are four reporting achievement levels for the CAST Summative and three reporting achievement levels for the CAA for Science, as shown in Table 2.

Table 2. CAST Summative and CAA for Science Reporting Achievement Levels

CAST Summative Reporting Achievement Levels	CAA for Science Reporting Achievement Levels
Level 1: Standard Not Met	Level 1: Limited Understanding
Level 2: Standard Nearly Met	Level 2: Foundational Understanding
Level 3: Standard Met	Level 3: Understanding
Level 4: Standard Exceeded	

Note: As of November 2024, the State Board of Education is reviewing the labels for these levels and may adjust them for the 2024–25 academic year.

These achievement levels are determined by using scale scores. Scale scores are calculated using statistical analysis to determine overall performance that is comparable across assessments. In other words, they are useful for comparing student performance across test administrations regardless of the specific form or questions students receive. The scales at each grade (5, 8, and high school) are different. Therefore, scale scores are only comparable within the same grade level, not across grade levels.

Detailed Test Results. The *Detailed Test Results* data include overall achievement and science domain results for all students tested and for each of the 14 student groups with 11 or more students.

Overall achievement. Data for overall achievement include the achievement level distribution (Levels 1–4) by grade and several reporting categories for grades 5, 8, 10, 11, 12, all high school, and all grades in the school. These reporting categories include the number of students enrolled, the number of students tested, the number of students with scores, the mean scale score, and the percentage of students in each achievement level.

Science domain. For the CAST summative assessment, the data by science domain (life sciences, physical sciences, earth and space sciences) show the percentage of students who fall into each science domain achievement level for grades 5, 8, 10, 11, 12, all high school, and all grades. Note that science domain achievement levels (above, near, and below standard—shown in Table 3) differ from the CAST Summative reporting achievement levels (1–4). The science domain-specific achievement levels were determined by calculating the distance between students' performance and the Level 3: Standard Met CAST reporting achievement level. (For more information, see the Understanding California Science Test (CAST) Summary Reports.) (Note: Domain achievement level data are not currently available for the CAA for Science.)

Table 3. CAST Summative Science Domain Achievement Levels and Descriptions

Science Domain Achievement Level	Description
Above Standard	…student demonstrates a **thorough** understanding of and ability to apply the knowledge and skills associated with the core ideas, concepts, and practices in the domain
Near Standard	…student demonstrates **some** understanding of and ability to apply the knowledge and skills associated with the core ideas, concepts, and practices in the domain
Below Standard	…student demonstrates **minimal** understanding of and ability to apply the knowledge and skills associated with the core ideas, concepts, and practices in the domain

Note: As of November 2024, the State Board of Education is reviewing the labels for these levels and may adjust them for the 2024–25 academic year.

For more information on accountability, including indicators and scale scores, see California's Accountability System and the Dashboard.

Strategies for Interpreting and Using CAST Data Effectively—With Considerations for Analysis of This New Information

Unlike the data for Smarter Balanced summative assessments for ELA and mathematics, which are available for students each year from grades 3–8 and grade 11, the CAST summative assessment results are only available at grade 5, grade 8, and once in high school (grade 10, 11, or 12). This difference in data availability may impact how CAST data are used. Below are examples of how schools and LEAs can use data to identify trends in student performance over time. Trend data is useful for informing and evaluating decisions to improve science education.

Using Data to Determine Trends in Overall Science Performance

Aggregate student performance can be gauged over time by comparing the percentage of students who fall into each of the four achievement levels (or three performance levels for the CAA) at a given grade band from year to year or by comparing the mean scale scores from year to year. Keep in mind that these data represent one assessment's results. Therefore, any emerging trends should be used alongside other data to determine progress in science education.

Using Data to Determine Trends in Science Domain Achievement Level

Comparing achievement level data in each science domain (life sciences, physical sciences, and earth and space sciences) may help determine the effects of educational decisions in each domain for elementary school, middle

school, and high school. Comparing the percentage of students in each achievement level in each domain from year to year may help identify trends that can be used to inform decisions and actions related to science learning—for example, on curriculum or program effectiveness in a particular course or subject (e.g., biology/life sciences, physics/physical sciences).

Using Data to Make Comparisons

The fact that CAST is not administered annually but, instead, only in grade 5, grade 8, and once in high school can complicate the question of how to analyze the data to understand student academic progress over time. One approach is to use fixed cohort studies—longitudinal comparisons where the same students are included at multiple points in time. Such studies allow for inferences about students' learning. However, they leave out students who are not present at one or more points in time. An example of a fixed-cohort comparison using longitudinal data would be to examine how today's grade 8 students performed compared to a matched set of the same students from three years ago when those students were in grade 5. As distinct from annual data comparisons, such as those generated by the ELA and mathematics assessments, longitudinal comparisons for science lengthen the time over which inferences about student performance are made.

In contrast, another approach is to analyze the data using dynamic cohort studies—cohort or grade-level comparisons where selected grades are included, but students change over time. Such studies allow for complete coverage of the grade level. However, they can be affected by the makeup of the cohort. An example of a dynamic cohort comparison would be determining how this year's grade 8 students performed compared to last year's grade 8 students. Cohort comparisons can be made annually but need to be considered with other factors that may affect group performance (e.g., composition of the cohort, changing resources, different instructional practices).

These two types of analyses generate different information that, alongside other data and contexts, may help inform decisions related to science education. Longitudinal data comparisons (fixed cohort studies) are better suited to help schools and LEAs determine where students were at one point in their learning to where they are now (e.g., did a student improve significantly from grade 5 to grade 8?). Cohort grade-level analyses (dynamic cohort studies) do not directly measure student progress in science but can help schools or LEAs better understand trends in student performance—thus supporting informed decision-making. It is important to note that determining the root causes of any identified changes in student performance requires analysis with additional data from the CAST summative assessments.

Decisions about which kind of analysis to conduct depend partly on the school level. For example, elementary schools cannot conduct aggregate cohort comparisons with CAST summative assessment data across grades since only grade 5 is tested. They *can* compare grade 5 results over successive years to identify trends. In addition, schools and LEAs may find value in comparing the CAST summative assessment data with science assessment data from their local assessment system to determine the degree of local and state alignment.

Middle and high schools can review cohort grade-level data (e.g., grade 8 results over time) or longitudinal-level data by looking back at students' previous (grade 5 or grade 8) CAST performance. However, not all California schools and LEAs have the capability to conduct what can turn out to be a complex analysis. For example, a middle school interested in longitudinal data may want to examine the grade 5 performance from its elementary feeder schools from three years prior to the current grade 8 data. If this is a fixed cohort analysis, it will include only those students present in both data sets. The analysts would need to be mindful of a potential pitfall: students present in multiple data sets within an LEA over time (e.g., grade 5 and grade 8) tend to have lower mobility and higher academic performance than more

mobile students. Alternatively, a middle school could do yearly cohort comparisons of grade 8 data by comparing the mean scale scores or the percentages of students in each of the four achievement levels or science domain achievement levels from year to year. High schools may choose to view cohort data similarly.

Schools and LEAs interested in individual student data can access Individual Student Reports (ISRs) for CAST through the California Educator Reporting System (CERS). (Note: Access to CERS requires a secure logon.)

Using Data to Determine Student Performance in Non-Tested Grades

Data from local assessment systems may be used to help gauge student performance in science for all grades in which the CAST summative is not administered (i.e., TK or K–grade 4, grades 6–7, and grade 9). These local data may be from teacher-selected classroom assessments (including periodic interim assessments and classroom summative assessments), district assessments, or site-selected assessments that may be common across grade levels or courses. (Note: Considerations about using data from local assessment systems are beyond the scope of this brief but may be covered in subsequent briefs.)

Additionally, the CAST interim assessments, released by the California Department of Education (CDE) in 2023, can help determine student science performance. These optional assessments are available for elementary schools (grades 3, 4, and 5; all domains in each assessment) and middle and high schools by science domain (life sciences, physical sciences, and earth and space sciences). The interim assessments have the same item types as the CAST summative assessments and are designed to help inform learning at the classroom level. They can be given to students using a standardized or non-standardized administration. An example of a standardized administration would be 4th grade students taking the entire grade 4 CAST

interim assessment individually online, much like the CAST summative assessment. An example of a non-standardized administration would be having students work in pairs or small groups to respond to a few stand-alone items or items in a performance task. The class can then discuss responses using the provided scoring materials as the basis for discussion. More information about CAST interim assessments is available on the CAASPP and ELPAC Interim Assessments web page on the *CASSPP & ELPAC* website.

Conclusion

As CAST performance data moves into the Dashboard for the first time, schools and LEAs will gain a new perspective on how their students perform in science. The indicators can help schools and LEAs quickly gauge the effectiveness of their science education programs and make informed decisions to help ensure that science programs are meeting their goals. While additional data are needed to determine root causes when student performance changes, ready access to CAST data will enable educators to have richer conversations about science education approaches and actions.

By including CAST data in the state accountability system, California underscores its priority on robust science education in all grades, starting in kindergarten. The Dashboard data for CAST will help schools and LEAs determine whether they are meeting expectations—that every school will provide science programs that prepare students to effectively participate as citizens in an increasingly technological world.

To realize the full benefit of including CAST data in the Dashboard, administrators, school leaders, assessment coordinators, and data analysts should start preparing now. LEAs and schools can begin convening educators to explain and discuss the Dashboard changes and determine how these data will be used locally. As CDE releases more technical specifics about the

science indicator, local officials can plan to share insights with teachers and parents. In particular, when results are released, data analysts can issue reports and exhibits that communicate those results in a clear, actionable way. Preparation now can help ensure that educators at all levels will be informed and ready to drive improved science outcomes for all students.

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