



SACRAMENTO CITY UNIFIED SCHOOL DISTRICT BOARD OF EDUCATION

Agenda Item 10.1

Meeting Date: June 6, 2019

Subject: Approve Middle School (6-8th) and High School (9-12th) Science Pathways

- Information Item Only
- Approval on Consent Agenda
- Conference (for discussion only)
- Conference/First Reading (Action Anticipated: _____)
- Conference/Action
- Action
- Public Hearing

Division: Academic Office / Curriculum and Instruction

Recommendation: We recommend that the board adopt the CA Preferred Science Integrated Pathway for 6-8th and the Earth Science Integrated Pathway for High School.

Background/Rationale: In 2016, the State Board of Education approved the new California Science Framework which outlined the ways and means in which LEAs and classrooms can transition to the NGSS. In middle school (6-8th) and high school (9-12th), the state did not dictate to LEAs how the standards should be organized into courses - the state allows LEAs to make that decision. SCUSD engaged in a decision making process that involved classroom teachers to issue a recommendation to the board.

Financial Considerations: None

LCAP Goal(s): College, Career and Life Ready Students

Documents Attached:

1. Executive Summary

Estimated Time of Presentation: 10 minutes

Submitted by: Dr. Iris Taylor, Chief Academic Officer

Matt Turkie, Assistant Superintendent, Curriculum and Instruction

Aaron Pecho, Science Coordinator

Approved by: Jorge A. Aguilar, Superintendent

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I. Overview/History of Department or Program

In 2013, the California State Board of Education joined other states in adopting the Next Generation Science Standards, an internationally benchmarked and research-based set of curriculum standards. The standards were developed by broad-based teams from 26 states including educators, academics and other experts in the fields of science and science education. The standards outline rigorous learning expectations for science content and a core set of engineering practices. This integration of rigorous content and application reflects how science and engineering is practiced in the real world.

In 2016, the State Board of Education approved the new California Science Framework which outlined the ways and means in which local education agencies LEAs and classrooms can transition to the NGSS. In middle school (6-8th) and high school (9-12th), the state did not dictate to LEAs how the standards should be organized into courses - the state allows LEAs to make that decision.

The proposed models in the CA Science Framework were designed in partnership with the framework authors and a Science Expert Panel (SEP) composed of science educators and practitioners. The general consensus from the SEP was to highlight the interconnected nature of science by proposing viable integrated models to facilitate instruction. In an integrated science model, students receive instruction from multiple domains of science (life, physical and earth) each year. This compares to a discipline specific approach where students receive instruction primarily from one discipline each year. The decision to favor integrated science instruction was largely based on data from other countries that produce scientists and engineers. The SEP noted that the United States is responsible for hiring most of the best minds in the fields of science and engineering, but not educating them. The SEP examined the international educational system that produced these individuals and found that they primarily experience integrated science instruction. The state of California recognized the work of the SEP and, in an attempt to reconcile the complex and variable structures of LEAs, concluded that integrated instruction should not be the only option for LEAs to choose. As such, the SEP also designed a domain or discipline specific pathway for each segment at the secondary level. The SEP felt strongly that integrated instruction should occur at least through 8th grade, thus the 6-8th integrated model is named the CA *Preferred* Integrated Model.

II. Driving Governance:

The California Science Framework outlines several possible models for LEAs to consider for high school (9th-12th) including: a discipline specific (4-course) model, an earth integrated (3-course) model and the national fully integrated (3-course) model. For middle school (6th-8th), the state provides 2 options: CA Preferred Integrated and Discipline Specific. Districts must decide an

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instructional pathway in both middle and high school that is in the best interest of students prior to engaging in an adoption of instructional materials for science.

"All Standards, All Students"

It is the vision of the CA NGSS that all students have access to all of the NGSS. At the middle school level, this could look like an instructional flow that makes sense to students as they navigate real world phenomena and problems. At the high school level, this could look like a course structure that moves from traditionally "advanced" science courses being considered electives to institutionalizing them as part of the core program. Students that successfully navigate the core instructional program per the CA NGSS vision would have at least three if not four years of a laboratory science. This notion directly connects to the Equity, Access, and Social Justice Guiding Principle: all students will be given the opportunity to graduate with the greatest number of post-secondary choices from the widest array of options. Students that have the opportunity to access three or four years of a laboratory science will have more access to advanced placement coursework, specialized science electives and competitive post-secondary institutions.

III. Budget:

Expected budget for 6th-12th grade adoption is \$6 million

Spending on secondary (6th-12th) pathways committees was \$10,000

IV. Goals, Objectives and Measures:

The goal of the recommended science pathway is to ensure the state's goal for the NGSS of "all standards for all students". As a part of the NGSS implementation, the district will monitor student performance on the CA Science Test and students' science course taking patterns at the high school level.

V. Major Initiatives:

Science Pathways Committees

The Science Pathways Committees were formed in an effort to engage educators in conversation to inform the instructional pathway recommendation to the board for approval. The committees met over a series of convenings and were open to all science teachers (or 6th grade teachers) within the segment. In these meetings, participants were made aware of the decision to be made as well as engaged in data gathering and open conversation regarding the merits of each model. The high school science pathways committee met in the 2016-2017 school year. At the conclusion of the convenings, the committee had narrowed the choices down to two: The 3-course Earth Integrated Model where the earth and space science standards are integrated amongst the Biology, Chemistry and Physics standards in three separate courses *and* the 4-course Discipline Specific Model where each content area (Biology,

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Chemistry, Physics, Earth Science) gets its own year-long course. The committee, however, could not come to consensus on either model for a clear recommendation to the board. The middle school pathways committee met in March 2019. At the conclusion of the meetings, the committee had discussed the merits of the two instructional models posed in the framework: The CA Preferred Integrated (every science, every year) Model and the Discipline Specific Model. Like the high school committee, the group could not come to consensus on either model for a clear recommendation to the board.

Science Pathways Voting

As a result of the committees not coming to consensus on any one instructional model, the decision was made to census all impacted teachers in the form of an online, non-anonymous vote. At the high school level, this was facilitated by science department heads during collaborative time. Department heads were asked to lead conversation around the pros/cons discussed by the high school science pathways committee and then vote at the end of the meeting once all voices had been solicited for comments and questions. Voting for high school closed on March 31st, 2019. At the middle school level, this was facilitated via an online form that engaged the group in passive learning before voting. Due to the number of teachers impacted and structural differences in collaborative time at the elementary level, this was not done in the same fashion as high school. All teachers in 6th grade and all 7th/8th grade science teachers were sent the link to access the voting form and relevant pros/cons that had been discussed by the middle school science pathways committee. Voting for middle school closed on April 30th, 2019.

The high school voting resulted in the selection of the *Earth Integrated Model* (75%) and the middle school voting resulted in the selection of the *CA Preferred Integrated Model* (59.7%). Upon Board approval, the district will engage stakeholders in the selection of NGSS aligned instructional materials aligned to the two pathways.

Science Curriculum Materials Adoption

SCUSD will utilize the Toolkit for Instructional Materials Evaluation (TIME) process to guide instructional materials adoption for science. The TIME process was adapted from the national process designed by Achieve (the authors of the NGSS), K-12 alliance, WestEd, and BSCS Science Learning. The TIME process involves three distinct phases to narrow down curriculum options and determine the instructional materials that are in the best interest of students within a LEA.

Phase 1: Prescreen of Instructional Materials

The prescreen of instructional materials is designed to be a short preview of materials to rank and eliminate programs across a broad, standardized rubric. As part of the prescreen process, LEAs are asked to work with their community to develop a district lens. This lens

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would be included in the rubric as part of the initial review. For SCUSD, our district lens included considerations for: English Language Development, Universal Design for Learning, and Equity/Access and Social Justice including cultural relevance and responsiveness. Programs that rank high enough in the prescreen process are considered when moving forward with a deeper, unit-level screening. Programs that aren't ranked high enough or programs that do not have enough evidence to indicate alignment to the rubric are eliminated from the adoption process. For SCUSD, this process will conclude in June 2019 for both high and middle school instructional materials.

Phase 2: Paper Screen of Instructional Materials

The paper screen of instructional materials involves a deeper look at the materials that made it through the prescreen. The committee examines a full instructional unit within a set of materials across 5 individual rubrics: Foundations, Student Work, Monitoring Student Progress, Teacher Support, Program Evaluation (optional). At the end of each rubric, consensus on scores is recorded and the program is either pushed forward to the next rubric or eliminated. After all materials are reviewed, the committee decides on two instructional materials to move forward to final pilot phase. For SCUSD, this process will conclude on August 2nd, 2019 for high and middle school instructional materials.

Phase 3: Piloting of Instructional Materials

The piloting of instructional materials involves an 8-week classroom trial run of both sets of instructional materials. Prior to piloting, piloting teachers and school sites are engaged in publisher training to use the materials effectively. During the piloting phase, teachers collect data systematically via digital journals and student work analysis in ongoing regular meetings. During this process, parent/community feedback and input will be garnered at school sites including but not limited to easy access to materials, back-to-school night presentations and parent advisory presentations. In addition, community forums for feedback and recommendation will be held at Parent-Information-Exchange (PIE) meetings and other district-wide committees. Piloting of materials and all pilot events will conclude January 2020. At the conclusion of the piloting process, the instructional community and community at large will issue a recommendation to the board for adoption and implementation during the 2020-2021 school year.

VI. Results:

The results from the high school and middle school voting are outlined below:

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High School Census Voting (n = 52)

Earth Integrated Model	Discipline Specific Model
39 (75%)	13 (25%)

Middle School (6-8th) Census Voting (n = 67)

CA Preferred Integrated Model	Discipline Specific Model
40 (59.7%)	27 (40.3%)

VII. Lessons Learned/Next Steps:

- Once the pathway has been adopted by the board, the respective committees of teachers will continue to pursue the adoption of aligned secondary curriculum materials.
- The science team will work in collaboration with the Communications Office to develop informational resources to explain the new science pathway options to parents/guardians, and students.