

Adopted, as amended, by the Board of Education at its Regular Meeting of June 9, 2015

Subject: Resolution No. 155-26A2

In Support of Expanding Computer Science and Digital Learning to All Students at All Schools from Pre-K to 12th Grade”

- Commissioners Matt Haney, Hydra Mendoza-McDonnell, Emily M. Murase, Ph.D, Sandra Lee Fewer, Rachel Norton, Shamann Walton, and Jill Wynns

WHEREAS: Through *Vision 2025*, SFUSD has redefined what it takes to thrive in San Francisco in the 21st century. Our students must have a more balanced education, where they learn not only content, but also critical thinking, real-world problem solving, leadership, collaboration, and creativity; and

WHEREAS: A key piece of the new Graduate Profile included in SFUSD's *Vision 2025* is the development of “Global, Local and Digital Identity”: the ability to navigate and engage in 21st century global society that is more inclusive and interconnected, in which students are “multilingual,” gaining exposure to or fluency in other languages that might range from Spanish and Chinese to sign language and computer science; and

WHEREAS: SFUSD's digital learning framework includes technology infusion in curricular areas and student support programs, digital literacy, school site technology coordination, and computer science curriculum and instruction. All of these strategies require adequate and equitable access to education technology in classrooms, schools, and district-wide; and

WHEREAS: Digital literacy must be an essential part of any digital learning framework, including familiarity with all general tools and skills, such as typing, that enable students and educators to interact with computers; and

WHEREAS: Computer science education is a key pillar of SFUSD's broader digital learning framework; and

WHEREAS: Computer science teaches important, transferable skills, including innovative thinking, creative problem solving, and cooperative learning. It is a driver of both innovation and economic productivity; and

WHEREAS: Combining mathematics, logic, algorithms, and storytelling, coding teaches us how to tackle large problems by breaking them down into smaller, more manageable problems. These are valuable skills for all students, and essential for many professions; and

WHEREAS: In the coming years, there will be far more computing jobs than there are U.S. computer science graduates to fill those jobs. Nationally, according to the National Science Foundation, there will be an estimated 1,000,000 unfilled computing jobs in 2020; and

WHEREAS: Information technology is the fastest growing job sector in San Francisco, accounting for at least 30% of San Francisco's overall job growth since 2010. San Francisco's tech employment rose 51.8% between 2007 and 2012; and

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WHEREAS: The tech industry in San Francisco does not reflect the broader racial, ethnic and gender diversity of our city or school population. Tech employment in San Francisco is 76% male and 26% female. It is 88% White and Asian American, 10% African American and Latino, and 2% other. Nationally, African Americans and Latinos comprised only 14% of all computer programmers, while women comprised only 23%; and

WHEREAS: In 2014, approximately 20,000 college educated individuals moved to San Francisco to take high wage jobs, many in the technology sector, while local residents, particularly African Americans and Latinos, often struggle to stay and thrive in a city where technology job growth is booming; and

WHEREAS: Even though the majority of students today will not become programmers or computer scientists, the knowledge and skills gained in computer science education are nevertheless critical to understanding the science underlying the technologies that are essential to today's world; and

WHEREAS: The current state of computer science in SFUSD is fragmented and voluntary, with a lack of equity and uneven quality; and

WHEREAS: There is little to no ongoing instruction in computer science in elementary schools. Just two middle schools have computer science electives, reaching just 0.5% of all 6-8 students; and

WHEREAS: Currently, only 5% of SFUSD high school students are enrolled in a computer science course, and only half of SFUSD high schools offer at least one course. Advanced Placement (AP) computer science courses exist at five schools, but participation is extremely limited: of the nearly 10,000 high school students who took AP exams in 2014, only 2.2% (209 total) took the AP Computer Science A exam; and

WHEREAS: Of the 209 SFUSD students who took the AP Computer Science exam last spring, only 22% were female and only 3% were African American, Latino, or Native American; and

WHEREAS: A number of afterschool and summer programs are offered for students in San Francisco to learn skills in coding and computer science, including FIRST Robotics League, Girls Who Code, Mission Bit, Square Code Camp, Black Girls Code, and Technovation; and

WHEREAS: In partnership with Mayor Lee and the Salesforce.com Foundation, SFUSD has set ambitious goals for the Mayor's Middle Grades Initiative: By 2016-2017, 100% of middle grades students will demonstrate mastery in the new Common Core State Standards for mathematics, integrated with digital content with 40 hours of computer science instruction; and

WHEREAS: The American Federation of Teachers and the United Educators of San Francisco seek to create innovative pathways for current teachers to develop skills in computer science and obtain authorization to teach computer science; and

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WHEREAS: SFUSD partners with external organizations that similarly seek to extend students' facility with computer science, including the Salesforce.com Foundation, Technology and Education Literacy in School (TEALS), Black Girls Code, Mission Bit, Code.org, Stanford University, and others; and

WHEREAS: Only about 10% of schools nationwide offer computer science; and

WHEREAS: Few large, urban school districts provide comprehensive computer science education to their students from pre-K to 12. Of those few, most districts have committed to providing computer science courses at all schools, but not to all students in all grades; and

WHEREAS: SFUSD is setting a bold, new precedent for large, urban school districts: to expand computer science education to not only all schools, but to all students; and

WHEREAS: Currently, no national, state, or local standards exist for computer science. Few school systems have begun teaching computer science from pre-K to 12th grade, and the academic research in computer science education is quite limited. As such, a cohesive progression of computer science knowledge and skills does not yet exist; and

WHEREAS: Through extensive academic research, observation of K-12 computer science classrooms and SFUSD teacher interviews, adaptation of Computer Science Teachers Association (CSTA) K-12 standards, and thorough analysis of many computer science curricula from diverse sources, SFUSD has developed our own comprehensive and coherent scope and sequence to articulate the full trajectory, from pre-kindergarten to twelfth grade, that will prepare our students for college and career and to guide the selection and development of our curriculum; and

THEREFORE BE IT RESOLVED: SFUSD commits to expand computer science education to all schools and all students, beginning in pre-kindergarten and extending through 12th grade; and

FURTHER BE IT RESOLVED: The commitment to expand computer science education is grounded in the following principles:

- Understanding how computers work and how to creatively use this knowledge to solve problems will be increasingly important for all students, as they prepare for college and their future careers.
- Computer science involves more than just programming. Students must also learn about computers and algorithmic processes, hardware and software designs, their applications, their impacts on society, among many other important habits of mind.

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- All students are capable of making sense of computer science in ways that are creative, interactive, _____ and _____ relevant.
- All students, from pre-K to 12, deserve access to rigorous and culturally meaningful computer science _____ education and should be held to high expectations for interacting with _____ the _____ curriculum.
- Students' access to and achievement in computer science must not be predictable on the basis of race, _____ ethnicity, gender, socioeconomic status, language, religion, sexual orientation, _____ cultural affiliation, _____ or _____ special _____ needs. _____
- The integration of different interpretations, strategies, and solutions that are computationally sound enhance classroom discussions and deepen understandings.
- The field of computer science will continue to rapidly evolve in sometimes unpredictable ways, and as such, _____ our plan for teaching computer science will also need the flexibility to continuously adapt; and _____

BE IT FURTHER RESOLVED: SFUSD adopts the following goals:

- in grades PK-5:
 - To provide engaging, relevant, creative and collaborative computer science instruction to all students
 - Generate excitement about computing.
 - Develop problem solving and critical thinking skills.
 - Foster _____ creativity _____ and _____ collaboration.
- in grades 6-8:
 - To provide engaging, relevant, creative and collaborative computer science instruction to all students.
 - Develop strong foundational knowledge and skills.
 - Explore issues raised by present and future societal impacts of computing.
- in grades 9-12:
 - Offer introductory and AP courses to all students at all schools.
 - Double AP participation.
 - Broaden participation to represent student population as a whole.
 - Strengthen and apply knowledge and skills, in order to engineer solutions to real world problems;
 - Explore collaborations with local colleges to offer dual enrollment options; and

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FURTHER BE IT RESOLVED: SFUSD's computer science education goals will begin to be phased in during the 2015-2016 school year; and

BE IT FURTHER RESOLVED: Decisions related to the computer science education, including pilots and roll-out, will be guided by SFUSD's commitment to equity, social justice, and closing the racial achievement and opportunity gaps; and

FURTHER BE IT RESOLVED: SFUSD will work closely with the City and County of San Francisco, community based organizations, technology companies, and other private industry, foundations, and the broader community of San Francisco in implementing the computer science education plan; and

BE IT FURTHER RESOLVED: The implementation of SFUSD's computer science standards will be in close partnership with SFUSD teachers and educators, and will include significant investments in professional development to ensure that current SFUSD teachers have the expertise, support and credentialing to teach computer science.

5/26/15

6/9/15