



Mountain View
Whisman
School District

Science Programs Update

April 2018





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Science Standards

Strategic Plan Goal 1

Goal 1: Student Achievement

Every student will be prepared for high school and 21st century citizenship

- Desired Outcome:
 - Elementary science curriculum that supports inquiry
- Action:
 - Adopt Next Generation Science Standards

Board of Trustees Goal 2018-19

Develop a plan of action to increase the science and technology offerings at all schools.

New Standards and Framework

- On September 4, 2013, the State Board of Education (SBE) adopted the *Next Generation Science Standards for California Public Schools, Kindergarten through Grade Twelve* (CA NGSS)
- The Next Generation Science Standards (NGSS) Framework was adopted in November 2016 and revised in February of 2017
- The state of California plans to have an approved list of instructional materials in November 2018 (the first operational test for Science is in spring of 2019)
- The CA NGSS are significantly different in content and rigor than the standards adopted in 1998

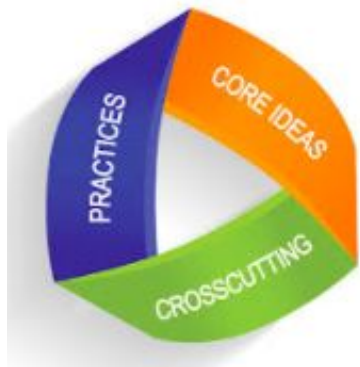
Old Standards vs. New Standards

Grade Level	Old Standard	CA NGSS
Kindergarten	Students know how to identify major structures of common plants and animals (e.g., stems, leaves, roots, arms, wings, legs).	Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
4th Grade	Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes	Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.
8th Grade	Students know the greater the mass of an object, the more force is needed to achieve the same rate of change in motion.	Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object

Next Generation Science Standards

- The CA NGSS emphasize the importance of having a deep understanding of science concepts and engaging in scientific thinking.
- The CA NGSS are described as having three dimensions: disciplinary core ideas, science and engineering practices, and crosscutting concepts
- The CA NGSS emphasizes:
 - the integration of science and engineering practices within the content
 - the integration of the Common Core State Standards for English language arts and Mathematics
 - the integration of skills and practices across the content areas as the foundation of STEM (Science, Technology, Engineering, and Mathematics) education
 - student understanding and use of scientific knowledge within and across science disciplines
 - learning progressions that develop from K-12
 - Allows for either integrated science or discipline specific in grades 6-8

3 Dimensions of Science Learning



Science and Engineering Practices (SEPs)	Behaviors that scientists engage in as they investigate and build models and theories about the natural world and the key set of engineering practices that engineers use as they design and build models and systems.
Disciplinary Core Ideas (DCIs)	Key organizing concepts, problem solving tools, or underlying principles of a discipline.
Crosscutting Concepts (CCCs)	Underlying themes that have value in all disciplines of science.



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Current Programming

Elementary Programming

Curriculum:

Full Option Science System, Delta Education - adopted in June 2007

Grade Level	Earth Science	Life Science	Physical Science
Kindergarten	Wood and Paper	Animals 2 x 2	Trees
First Grade	Air and Weather	Plants and Animals	Solids and Liquids
Second Grade	Pebbles, Sand and Silt	Insects and Plants	Balance and Motion
Third Grade	Sun, Moon, Stars	Structures of Life	Matter and Energy
Fourth Grade	Solid Earth	Environments	Magnetism and Electricity
Fifth Grade	Water Planet	Living Systems	Mixtures and Solutions

Elementary Programming

- Transitional Kindergarten was not implemented in 2006. Teachers support students in:
 - Learning to observe objects using the five senses.
 - Understanding time, seasons and the different types of plants and animals on earth.
 - Measuring, observing and predicting how materials will react and change.
- Elementary schools teach History-Social Science a minimum of two periods per week

Elementary Programming

- Elementary sites having been focusing on English Language Arts, English Language Development and the Sheltered Instruction Observation Protocol (SIOP) and are at different points in transition to CA NGSS
- Response to Instruction science lessons at Bubb, Huff, and Stevenson are CA NGSS aligned
- RTI teachers from Bubb have worked collaboratively with the middle school science coach
- Teachers at Castro have participated in NGSS training through the County Office of Education and through Science is Elementary
- Teachers at Stevenson and Monta Loma have begun professional development in CA NGSS this year

Middle School Science

- The middle school science department began their work with NGSS in 2015
- After attending the first NGSS symposium and participating in a full day of training with the science coordinator from Santa Clara County Office of Education, the science department made the choice to focus on an integrated model
- This model required a great deal of collaboration, training, and adjustment of programming at each grade level

Middle School NGSS Training

- Middle School Science department attended NGSS Symposiums #1-4
 - 2/15, 11/15, 1/16, 12/17
- Training with Science coordinator from Santa Clara County Office of Education - 8/15
- Release days used for teachers to develop CA NGSS lessons with the science coach
- Summer planning in June 2017 focused on grade level scope and sequence
- Summer planning 2018 will focus on NGSS assessments

Middle School NGSS Programming

Curriculum: Prentice Hall CA Focus on Science
- adopted in June 2007

The middle school science team collaboratively designed NGSS lessons and a grade level scope and sequence that focused on

- Instructional units
- Performance Expectations
- Science and Engineering Practices
- Disciplinary Core Ideas
- Cross Cutting Concepts

Middle School Science

The science coaches from the District, Mountain View Los Altos Union High School District, and Los Altos School District began collaborating in 2016-17 to support vertical articulation with the high school on the following topics:

- Science and Engineering Practice (SEP) 6
Constructing Explanations
- Science and Engineering Practice (SEP) 7
Engaging in Arguments from Evidence
- Assessments



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Things to Consider

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- There will be a new operational Science test in spring 2019
- Our materials are out of date and new adoptions need to be completed once materials are approved by California
- Professional Development is needed for teachers on the new framework and any newly adopted curriculum especially in elementary school
- Providing professional development and new curriculum is relatively easier for middle school teachers who are content experts
- Teachers have been learning new standards in mathematics, English Language Arts, Literacy, and English Language Development since 2014
- In 2020, it starts all over again with an updated mathematics framework and curriculum for possible adoption



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Next Steps

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- Develop a comprehensive plan for science instruction
- Participate in the Wipro Science Education Fellowship at the Center to Support Excellence in Teaching (CSET), Stanford Graduate School of Education (3 cohorts of 3-4 teachers over 4 years)
 - Classroom teachers to receive 2 years of training in science instructional practices, leadership strategies to improve science teaching and learning at sites and District wide, and improving achievement in science
- Develop a timeline for professional development and curriculum adoptions for History-Social Science and Next Generation Science Standards as they are so close together
- Follow the state guidelines for adopting instructional materials