Grade 4: Physical Sciences, Earth Sciences, Life Sciences, Investigation and Experimentation

California State Science Content Standards

Covered in:

Hands-on science labs, demonstrations, & activities. Investigation and Experimentation.

Presented by Climate Change Education .org during

Mobile Climate Science Labs

• Professional development for teachers
• In school presentations
• Climate science and hands-on education *specialists* presenting alongside teachers and teaching assistants
• Presentations at CSTA, NSTA, AAAS conferences
• For school field trips, as presented at local science museums

As aligned with existing science content standards, adopted 1997
Referencing: *Science Framework for California Public Schools*
http://www.cde.ca.gov/ci/sc/cf/documents/scienceframework.pdf
Adopted by the California State Board of Education
Published by the California Department of Education

Enabling teachers and schools to provide outstanding education called for in the standards under *Investigation and Experimentation* sections.
Requirements for a minimum of 20-25% hands-on education in science.

Index of Standards Alignment—other grades, courses and standards:
http://climatechangeeducation.org/labs/k12_standards/index.html

Themes: http://climatechangeeducation.org/labs/themes/index.html

In the following, sections of standards noted are part of one or more lab theme. Sections highlighted in green are a *primary focus* of one or more hands-on science lab.

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Standard Set 1 -- Physical Sciences

1. Electricity and magnetism are related effects that have many useful applications in everyday life. As a basis for understanding this concept:

1. a. *Students know* how to design and build simple series and parallel circuits by using components such as wires, batteries, and bulbs.

1. g. *Students know* electrical energy can be converted to heat, light, and motion.

Standard Set 2 -- Life Sciences

2. b. *Students know* producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.

Standard Set 3 -- Life Sciences

3. Living organisms depend on one another and on their environment for survival. As a basis for understanding this concept:

3. a. *Students know* ecosystems can be characterized by their living and nonliving components.

3. b. *Students know* that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.

Standard Set 4 -- Earth Sciences (Rocks and Minerals)

Standard Set 5 -- Earth Sciences (Waves, Wind, Water and Ice)

5. Waves, wind, water, and ice shape and reshape Earth's land surface. As a basis for understanding this concept:

5. a. *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.

Standard Set 6 -- Investigation and Experimentation

6. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

6. a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

6. b. Measure and estimate the weight, length, or volume of objects.

6. c. Formulate and justify predictions based on cause-and-effect relationships.

6. d. Conduct multiple trials to test a prediction and draw conclusions about the relationships between predictions and results.

6. e. Construct and interpret graphs from measurements.

6. f. Follow a set of written instructions for a scientific investigation.