

Biology (Life Sciences) -- Grades 9, 10, 11, and 12

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.

Updated April 27, 2011

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Standard Set 1 Cell Biology

1. b. *Students know* enzymes are proteins that catalyze biochemical reactions without altering the reaction equilibrium and the activities of enzymes depend on the **temperature**, ionic conditions, and **the pH of the surroundings**.

1. f. *Students know* **usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide**.

Standard Set 2-5 Genetics

Standard Set 6 Ecology

6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:

6. a. *Students know* biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.

6. b. *Students know* **how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size**.

6. d. *Students know* **how water, carbon, and nitrogen cycle between abiotic resources and organic matter in the ecosystem and how oxygen cycles through photosynthesis and respiration**.

Standard Set 7 Evolution (Population Genetics)

Standard Set 8 Evolution (Speciation)

8. b. *Students know* a great diversity of species increases the chance that at least some organisms survive major changes in the environment.

Standard Set 9 Physiology

9. As a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the outside environment. As a basis for understanding this concept:

9. a. *Students know* how the complementary activity of major body systems provides cells with oxygen and nutrients and removes toxic waste products such as carbon dioxide.