

Integrated/Coordinated Science One – Biology

Content Standards

Evolution

8. Evolution is the result of genetic changes that occur in constantly changing environments. As a basis for understanding this concept:
 - a. *Students know* how natural selection determines the differential survival groups of organisms.
 - b. *Students know* a great diversity of species increases the chance that at least some organisms survive major changes in the environment.
 - c. *Students know* how to analyze fossil evidence with regard to biological diversity, episodic speciation, and mass extinction.

Biology – Process Standards

Investigation and Experimentation

1. **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 four strands, students should develop their own questions and perform investigations. Students will:**
 - a. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.
 - b. Identify and communicate sources of unavoidable experimental error.
 - c. Identify possible reasons for inconsistent results, such as sources of error and uncontrolled conditions.
 - d. Formulate explanations by using logic and evidence.
 - e. ~~Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.~~
 - f. Distinguish between hypothesis and theory as scientific terms.
 - g. Recognize the usefulness and limitations of models and theories as scientific representations of reality.
 - h. Read and interpret topographic and geologic maps.
 - i. Analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).
 - j. Recognize the issues of statistical variability and the need for controlled tests.
 - k. Recognize the cumulative nature of scientific evidence.
 - l. Analyze situations and solve problems that require combining and applying concepts from more than one area of science.
 - m. Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.
 - n. Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets).

| Analyzed Standards 8b, 6g, 8a, 8e | Instructional Activities, Resources, and Performance Tasks | Notes and Integrated Connections | Materials (<u>underlined are in LAUSD kit</u>) |
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| <p>8b.</p> <ul style="list-style-type: none"> Recognize that diversity between and among species increases the chances of surviving changes in the environment (both present and future). <p>6g.</p> <ul style="list-style-type: none"> Compare individual adaptations for survival to the gradual adaptations of a species over time. | <p>Chapter 10 – <i>A Highway through the Past</i>; pp. 578-624</p> <p>Activity 1 - <i>Adaptations</i>; pp. 580-589 What Do You Think?; p. 580 For You to Do; pp. 580-584 Bio Talk; <i>Adaptation</i>; pp. 584-587 Biology to Go; p. 588 Inquiring Further; p. 589 Activity Debrief</p> <p>Activity 2 – <i>Is It Heredity or the Environment</i>; pp. 590-596 What Do You Think?; p. 590 For You to Do; pp. 590-592 Bio Talk; <i>The Importance of Heredity and Environment</i>; pp. 593-595 Biology to Go; p. 596 Inquiring Further; p. 596 Activity Debrief</p> <p>Supplemental Activities/Resources: Case Studies</p> <ul style="list-style-type: none"> Mosquitoes, Malaria and Sickle Cell | <p>Biology at Work; p. 624</p> <p>Ecology 6a, 6b</p> <p>Evolution 8b Earth 3a, c</p> | <p><u>Activity 1</u> Making tape Coins</p> <p><u>Activity 2</u> Blotting paper Petri dishes Tobacco seeds Black plastic bags of lightproof containers</p> |

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| <p>8a. Analyze predator-prey relationships based on the: 1) survival of an individual organism, 2) influence of environmental changes on the organisms, 3) species adaptations, and 4) future generations.</p> | <p>Activity 3 – Natural Selection; pp. 597-606 What Do You Think?; p. 597 For You to Do; pp. 597-601 Bio Talk; <i>Theories in Science</i>; pp. 602-605 Biology to Go; p. 606 Inquiring Further; p. 606 Activity Debrief</p> <p>Supplemental Activities/Resources Case Studies Galapagos Islands Galapagos Islands Industrial Melanism studies Insects and Pesticides Insects and Pesticides Mosquitoes and DDT Mountain Lions, Bobcats, Coyotes (CA) Mountain Lions, Bobcats, Coyotes (CA) Yellowstone Wolves http://ublib.buffalo.edu/libraries/projects/cases/case.html Bottle Neck Genes-Project Wild Bird Beak Lab</p> | | <p><u>Activity 3</u> Newspaper 50 - half inch squares cutout of newspapers 50 - half inch squares cutout of white papers 50 – half inch squares cutout of red paper</p> |

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| <p>8e. Analyze fossil evidence with regard to biological diversity, episodic speciation, and mass extinction.</p> | <p>Activity 4 – <i>The Fossil Record</i>; pp. 607-616 What Do You Think?; p. 607 For You to Do; pp. 607-610 Bio Talk; <i>The Nature of the Fossil Record</i>; pp. 611-615 Biology to Go; p. 615 Inquiring Further; p. 616 Activity Debrief</p> <p>Activity 5 – <i>Mass Extinction and Fossil Records</i>; pp. 617-624 What Do You Think?; p. 617 For You to Do; pp. 617-620 Bio Talk; <i>Making Inferences in Science</i>; pp. 620-622 Biology to Go; p. 623 Inquiring Further; p. 623 Activity Debrief</p> | | <p><u>Activity 4</u> <u>plaster</u> <u>clamshell</u> <u>petroleum jelly</u> confetti cup masking tape <u>small hammer</u> small paper plate <u>Hot-glue gun with glue sticks</u> <u>Tweezers</u> Small seeds Modeling clay Rolling pin or bottle</p> <p><u>Activity 5</u> No materials needed</p> |