



LAB-AIDS CORRELATIONS FOR



OKLAHOMA ACADEMIC STANDARDS FOR SCIENCE (OAS-S)

HIGH SCHOOL BIOLOGY

Mark Koker, Ph D, Director of Curriculum & Professional Development, Lab-Aids
Lisa Kelp, Curriculum Specialist, Lab-Aids

This document shows how the *SGI BIOLOGY* materials align with the *Oklahoma Academic Standards for Science*¹.

ABOUT US

Lab-Aids has maintained its home offices and operations in Ronkonkoma, NY, since 1963. We publish over 200 kits and core curriculum programs to support science teaching and learning, grades 6-12. All core curricula support an inquiry-driven pedagogy, with support for literacy skill development and with robust support for assessment. All programs have extensive support for technology and feature comprehensive teacher support. For more information please visit www.lab-aids.com and navigate to the program of interest.

ABOUT SEPUP

Materials from the Science Education for Public Understanding Program (SEPUP) are developed at the Lawrence Hall of Science, at the University of California, Berkeley, and distributed nationally by Lab-Aids, Inc. Development of SEPUP materials is supported by grants from the National Science Foundation. SEPUP programs are available as full year courses, or separately, as units, each taking 3-9 weeks to complete. For more information about SEPUP, visit www.sepuplhs.org.

ABOUT SCIENCE AND GLOBAL ISSUES BIOLOGY

Science and Global Issues: Biology was developed by SEPUP with grant support from the National Science Foundation. It was field tested nationally in classrooms across the country. The program consists of a student book, equipment kit, print and online teacher resources, and online content for students, including additional print, video, digital simulations and more. The five units in this course look at topics such as human impact on ecosystems, world health, genetically modified organisms, and biodiversity. In each unit, students are challenged to reason scientifically while applying their understanding of the main concepts of that unit: sustainability, ecology, cell biology, genetics, and evolution.

¹ <https://sde.ok.gov/sites/default/files/Oklahoma%20Academic%20Standards%20for%20Science.pdf>

For more information on the *Science and Global Issues: Biology* program, please visit <https://store.lab-aids.com/high-school-curriculum/science-global-issues-biology>.

| SGI Biology Unit Title | Student Book Pages | Issue Focus |
|----------------------------------|---------------------------|--|
| Sustainability | 1-46 | Aspects of sustainability from a personal, community and global perspective |
| Ecology: Living on Earth | 43-154 | Sustainability from an ecosystems perspective, with a focus on humans' impacts on ecosystems. Making decisions regarding fisheries management |
| Cell Biology: World Health | 155-258 | Disparities between developing and developed countries in terms of diseases' impacts on life Making decisions about priorities for diseases that limit social, economic, and environmental progress |
| Genetics: Feeding the World | 259-412 | Comparison of selective breeding and genetic modification Use of genetically modified organisms, particularly in the production of agricultural crops |
| Evolution: Maintaining Diversity | 413-512 | Conserving genetic, species and ecosystem diversity Ecosystems services and intrinsic value models for conservation |

ABOUT THE LAB-AIDS CITATIONS

The following tables are presented in an OAS-S format. Locations in *SGI Biology* that support the OAS-S are identified. Disciplinary Core Ideas (DCI) are indicated, but this is not an exhaustive list.

The following citation...

C3, C4, C9, (C12)

...means the standard is addressed in Unit C in the listed activities (C3, C4, C9, C12). Parentheses are used to show partial coverage of the Standard.

FROM MOLECULES TO ORGANISMS: STRUCTURES AND PROCESSES (LS1)

| OKLAHOMA ACADEMIC STANDARD FOR SCIENCE | LOCATION IN SEPUP |
|--|--|
| B.LS1.1 Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells. | C10, C14, D2, (D3), (D5), D10, D11, (D14), D16, (D17), (D19) |
| B.LS1.2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. | C3, C4, C9, C12, C14, C15 |
| B.LS1.3 Plan and conduct an investigation to provide evidence of the importance of maintaining homeostasis in living organisms. | Not covered |
| B.LS1.4 Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. | C13, C14, C15, D17 |
| B.LS1.5 Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. | (B9), (B10), (B11), C12 |
| B.LS1.6 Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. | (B9), B11, C12, Appendix F |
| B.LS1.7 Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy. | B9, B10, B11, C12 |

ECOSYSTEMS: INTERACTIONS, ENERGY, AND DYNAMICS (LS2)

| OKLAHOMA ACADEMIC STANDARD FOR SCIENCE | LOCATION IN SEPUP |
|--|---------------------------------|
| B.LS2.1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacities of ecosystems at different scales. | B14, B17 |
| B.LS2.2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. | B16, B17 |
| B.LS2.3 Construct and revise an explanation based on evidence for the cycling of matter and the flow of energy in aerobic and anaerobic conditions. | (B8), (B9), (B10), (B11), (B12) |
| B.LS2.4 Use a mathematical representation to support claims for the cycling of matter and the flow of energy among organisms in an ecosystem. | (B7), (B8) |
| B.LS2.5 Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere. | (B8), B9 |

| OKLAHOMA ACADEMIC STANDARD FOR SCIENCE | LOCATION IN SEPUP |
|--|---|
| B.LS2.6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. | (B1), (B4), (B5), (B12), (B13), (B14), B16, (B17), (B18), (B19) |
| B.LS2.8 Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce. | |

HEREDITY: INHERITANCE AND VARIATION OF TRAITS (LS3)

| OKLAHOMA ACADEMIC STANDARD FOR SCIENCE | LOCATION IN SEPUP |
|---|------------------------------------|
| B.LS3.1 Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring. | D1, D2, D3, D5, D10, D11, D15, D16 |
| B.LS3.2 Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors. | (C13,) D12, D13, D14, D16 |
| B.LS3.3 Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population. | D4, D5, D6, D7, D12 |

BIOLOGICAL UNITY AND DIVERSITY (LS4)

| OKLAHOMA ACADEMIC STANDARD FOR SCIENCE | LOCATION IN SEPUP |
|--|-------------------------------------|
| B.LS4.1 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. | E4-E11, E13-14 |
| B.LS4.2 Construct an explanation based on evidence that biological diversity is influenced by (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. | E4, E11, E12, E13 |
| B.LS4.3 Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait. | E11, E12 |
| B.LS4.4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations. | E4, E5, E6, E7, (E8), E11, E12, E13 |
| B.LS4.5 Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. | E3-E7, (E8), E10-E14 |