LAB-AIDS Correlations to Alaska Content Standards

Science Grades 9-11

High School Biology[1]

Science and Global Issues: Biology (SGI Biology) was developed by the SEPUP group, at the Lawrence Hall of Science, University of California Berkeley, under the direction of Dr Barbara Nagle, SEPUP Director. Development of *SGI Biology* is supported by grants from the National Science Foundation. *SGI Biology* is published by, and available exclusively from, LAB-AIDS, Ronkonkoma NY, 800.381.8003.

This document was prepared by Oralia Gil, Curriculum Specialst and Mark Koker, Ph D, Director of Curriculum and Training at LAB-AIDS. This is not an exhaustive document. It is designed to provide a general overview of the alignment of *SGI Biology* to the state science program standards, grades 9-12, for review and adoption purposes. Support for the state standards may be found at other locations besides those explicitly stated in this document.

For more information about this correlation or for questions about review copies, presentations, or any matters related to sales or service, please contact our sales associate Dilani Rosa, Regional Sales Manager 925.270.7413, Dilani@LAB-AIDS.com, or visit us on the web at www.lab-aids.com.

[1] http://www.eed.state.ak.us/standards/pdf/standards.pdf

Science in Global Issues 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

Key to SEPUP Assessment System:

SEPUP materials include research-based assessment system developed by SEPUP and the Berkeley Evaluation and Assessment Research Group (BEAR) in the University of California Graduate School of Education. Forming the core of the SEPUP Assessment System are the **assessment variables** (content and process skills to be assessed), **assessment questions or tasks** used to gather evidence and **scoring guides** for interpreting students' responses (correspond to assessment variables).

The seven assessment variables are:

Designing Investigations (DI)
Organizing Data (OD)
Analyzing Data (AD)
Understanding Concepts (UC)
Evidence and Trade-offs (ET)
Communication Skills (CS)
Group Interaction (GI)

Types of assessment:

Quick Checks (✓) present opportunities for informal formative assessment and may be used prior to instruction to find out what students know or think. They may also be used to help teachers track students' knowledge of key information or progress in understanding a concept.

Some embedded questions and tasks and all item bank questions are all suitable for summative assessment. Analysis questions are included at the end of each activity.

Citations included in the correlation document are as follows:

ECO 5 AQ 1-4 means that the standard or benchmark may be assessed using Ecology Activity 5 Analysis Questions 1-4.

For more information on program assessment and using SEPUP rubrics, consult the Teacher's Guide, TR part IV.

Science Grades 9 – 11

Alaska Science Performance Standards/Grade Level Expectations	SGI Biology Location	Where assessed…
A1—Science as Inquiry and Process		
The student demonstrates an understanding of the processes of science by		
[9] SA1.1 asking questions, predicting, observing, describing, measuring, classifying, making generalizations, inferring, and communicating*	Throughout (e.g. ECO 1; GEN 12)	ECO 1 AQ4 GEN 12 AQ2
[9] SA1.2 hypothesizing, designing a controlled experiment, making qualitative and quantitative observations, interpreting data, and using this information to communicate conclusions	Throughout (e.g. ECO 1; GEN 12)	ECO 1 AQ4 GEN 12 AQ2
[10] SA1.1 asking questions, predicting, observing, describing, measuring, classifying, making generalizations, analyzing data, developing models, inferring, and communicating	Throughout (e.g. ECO 1; GEN 12)	ECO 1 AQ4 GEN 12 AQ2
[10] SA1.2 reviewing pertinent literature, hypothesizing, making qualitative and quantitative observations, controlling experimental variables, analyzing data statistically (i.e., mean, median, mode), and using this information to draw conclusions, compare results to others, suggest further experimentation, and apply student's conclusions to other problems (**L**)	Throughout (e.g. GEN 20; EVO 6, ECO 2)	GEN 20 AQ1, 2; EVO 6 AQ2; ECO 2 AQ1-3
[11] SA1.1 asking questions, predicting, observing, describing, measuring, classifying, making generalizations, analyzing data, developing models, inferring, and communicating*	Throughout (e.g. EVO 5; ECO 18-19)	EVO 5 AQ5 ECO 18 AQ1
[11] SA1.2 recognizing and analyzing multiple explanations and models, using this information to revise student's own explanation or model if necessary (**L**)	Throughout (e.g. GEN 16; EVO 6)	GEN 16 AQ4
The student demonstrates an understanding of the attitudes and approaches to scientific inquiry by		
[9] SA2.1 formulating conclusions that are logical and supported by evidence	Throughout (e.g. EVO 10; ECO 12	EVO 10 AQ3 ECO 12 AQ6, 7
[10] SA2.1 examining methodology and conclusions to identify bias and determining if evidence logically supports the conclusions	Throughout (e.g. GEN 18	GEN 18 AQ2
[11] SA2.1 evaluating the credibility of cited sources when conducting the student's own scientific investigation (**L**)	Throughout	
The student demonstrates an understanding that interactions with the environment provide an opportunity for understanding scientific concepts by		
[11] SA3.1 conducting research and communicating results to solve a problem (e.g., fish and game management, building permits, mineral rights, land use policies) (**L**)	Throughout (e.g. GEN 15; ECO 5; ECO 18-19)	GEN 15 AQ2 ECO 5 AQ7; ECO 19 AQ4)
C1—Concepts of Life Science		
The student demonstrates an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution by		
[9] SC1.1 recognizing that all organisms have chromosomes made of DNA and that DNA determines traits	CELL 8 GEN 3, 12-14	GEN 14 AQ1-3
[9] SC1.2 using probabilities to recognize patterns of inheritance (e.g., Punnett Squares)	GEN 4-6	GEN 4 AQ1-3
[9] SC1.3 inferring evolutionary pathways from evidence (e.g., fossils, geologic samples, recorded history)	EVO 3-5	EVO 3 AQ4; EVO 5 AQ4, 5
[10] SC1.2 explaining how the processes of natural	EVO 4, 6, 10, 11	EVO 10 AQ10; EVO

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selection can cause speciation and extinction		111 AQ2, 3
[10] SC1.3 examining issues related to genetics (**L**)	GEN 1, 6, 7, 11	GEN 6 AQ3; GEN 7 AQ6
[11] SC1.1 relating the structure of DNA to characteristics of an organism	GEN 10, 17	GEN 10 AQ4; GEN 17 AQ5
[**11] SC1.2** researching how the processes of natural selection cause changes in species over time (**L**)	EVO 4, 10, 11	EVO 11 AQ1
The student demonstrates an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms by		
[9] SC2.1 describing and comparing the characteristics of phyla/divisions from each kingdom	Appendix G EVO 7, 10	EVO 10 AQ1
[9] SC2.3 stating the function of major physiological systems (i.e., circulatory, excretory, digestive, respiratory, reproductive, nervous, immune, endocrine, musculoskeletal, and integumentary)	NC	
[10] SC2.1 describing the structure-function relationship (e.g., joints, lungs)	CELL 5-9	CELL 5 AQ1, CELL 6 AQ4
[10] SC2.2 explaining that cells have specialized structures in which chemical reactions occur	CELL 3-9	CELL 9 AQ5
[10] SC2.3 explaining the functions of organs of major systems (i.e., respiratory, digestive, circulatory, reproductive, nervous, musculoskeletal, and excretory)	NC	
[10] SC2.4 tracing the pathways of the digestive, circulatory, and excretory systems	NC	
[11] SC2.1 describing the structure-function relationship*	CELL 5-9	CELL 5 AQ1, CELL 6 AQ4
[11] SC2.2 describing the learned behaviors (e.g., classical conditioning, imprinting, trial and error) that are utilized by living organisms to meet the requirements of life	NC	
[11] SC2.3 describing the functions and interdependencies of the organs within the immune system and within the endocrine system	NC	
The student demonstrates an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy by		
[9] SC3.1 describing the carbon and nitrogen cycle within an ecosystem and how the continual input of energy from sunlight keeps the process going (**L**)	ECO 8	ECO 8 AQ5
[9] SC3.3 identifying dynamic factors (e.g., carrying capacity, limiting factors, biodiversity, and productivity) that affect population size	ECO 2-7	ECO 2 AQ7
[10] SC3.1 relating the carbon cycle to global climate change	ECO 8	ECO 8 AQ4
[10] SC3. 2 exploring ecological relationships (e.g., competition, niche, feeding relationships, symbiosis) (**L**)	ECO 3, 7, 13	ECO 3 AQ1; ECO 7 AQ5; ECO 13 AQ2
[11] SC3.1 relating the carbon cycle to global climate change*	ECO 8	ECO 8 AQ4
[11] SC3.2 analyzing the potential impacts of changes (e.g., climate change, habitat loss/gain, cataclysms, human activities) within an ecosystem	ECO 12, 14	ECO 12 AQ4, 5; ECO 14 AQ1-3
E1—Science and Technology		
The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by		
[9] SE1.1 recognizing that the value of any given	GEN 17	GEN 17 AQ6, 7

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technology may be different for different groups of people and at different points in time (e.g., different uses of snow machines in different regions of Alaska)	CELL 6	CELL 6 AQ3
[10] SE1.1 identifying that progress in science and invention is highly interrelated to what else is happening in society	SUS 1-6	
[11] SE1.1 researching how social, economic, and political forces strongly influence which technology will be developed and used (**L**)	GEN 18-20	GEN 18 AQ4; GEN 20 AQ4
The student demonstrates an understanding that solving problems involves different ways of thinking by		
[9] SE2.1 questioning, researching, modeling, simulating, and testing a solution to a problem (**L**)	CELL 6, GEN 20	CELL 6 AQ2; GEN 20 AQ3, 4
[10] SE2.1 questioning, researching, modeling, simulating, and testing multiple solutions to a problem (**L**)	CELL 6, GEN 20	CELL 6 AQ2; GEN 20 AQ3, 4
[11] SE2.1 questioning, researching, modeling, simulating, and testing multiple solutions to a problem* (**L**)	CELL 6, GEN 20	CELL 6 AQ2; GEN 20 AQ3, 4
The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by		
[9] SE3.1 predicting and evaluating the possible effects of a recent scientific discovery, invention, or scientific breakthrough (**L**)	GEN 19	GEN 19 AQ2
[10] SE3.1 researching a current problem, identifying possible solutions, and evaluating the impact of each solution (**L**)	CELL 8	CELL 8 AQ6
[11] SE3.1 researching a current problem, identifying possible solutions, and evaluating the impact of each solution* (**L**)	ECO 4	ECO 4 AQ4
F1—Cultural, Social, Personal Perspectives, and Science		
The student demonstrates an understanding of the dynamic relationships among scientific, cultural, social, and personal perspectives by		
[9] SF1.1-SF3.1 describing the scientific principles involved in a subsistence activity (e.g., hunting, fishing, gardening) (**L**). Cross referenced with SA3.1.	ECO 5, 14	ECO 5 AQ7; ECO 14 6, 7
[10] SF1.1-SF3.1 analyzing the competition for resources by various user groups to describe these interrelationships. Cross referenced with SA3.1.	ECO 1, 15-17	ECO 1 AQ1; ECO AQ2
[11] SF1.1-SF3.1 investigating the influences of societal and/or cultural beliefs on science (**L**). Cross referenced with SA3.1.	ECO 18, 19	ECO 19 AQ3
G1—History and Nature of Science		
The student demonstrates an understanding of changes in historical perspectives of science by		
[9] SG1.1 identifying those perspectives (i.e., cultural, political, religious, philosophical) that have impacted the advancement of science	SUS 1-6	SUS 3 AQ2
[10] SG1.1 describing how those perspectives (i.e., cultural, political, religious, philosophical) have impacted the advancement of science	SUS 1-6	SUS 3 AQ2
The student demonstrates an understanding of the bases of the advancement of scientific knowledge by		
[9] SG2.1 explaining the importance of innovations (i.e., microscope, immunization, computer)	CELL 6	CELL 6 AQ3
[10] SG2.1 using an account of an event to recognize the processes of science used by historically significant scientists (e.g., Goodall, Watson & Crick, Newton)	EVO 4	EVO 4 AQ2
[11] SG2.1 describing the importance of logical	EVO 9	EVO 9 AQ2

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arguments (i.e., thought experiments by Einstein, Hawking, Newton)		
The student demonstrates an understanding that scientific knowledge is ongoing and subject to change by		
[9] SG3.1 describing the role of serendipity in scientific discoveries	NC	
[10] SG3.1 using experimental or observational data to evaluate a hypothesis	Throughout	
[11] SG3.1 investigating instances when scientists' observations were not in accord with prevailing ideas of the time (**L**)	CELL 15	CELL 15 AQ1-3
The student demonstrates an understanding that advancements in science depend on curiosity, creativity, imagination, and a broad knowledge base by		
[10] SG4.1 recognizing the role of these factors on scientific advancements	Throughout	