



LAB-AIDS Correlations to North Carolina Essential Standards for Biology

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 *Science and Global Issues Biology* is supported by grants from the National Science Foundation.

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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:

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

5: AQ 1-4, 5 UC means that in addition to AQ1-4, AQ 5 uses the Understanding Concepts scoring guide for Activity 5.

16 Proc UC means that the procedure (Proc) of Activity 16 contains an embedded task and uses the Understanding Concepts scoring guide.

ST 3 p.211 means that the embedded literacy strategy STOP TO THINK 3 on page 211 address this standard.

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

Reference	Descriptor	Location in SGI Biology	
		Student Book	Assessment
<i>Structure and Function of the Living Organism</i>			
Bio.1.1	Understand the relationship between the structures and functions of cells and their organelles.		
Bio.1.1.1	Summarize the structure and function of organelles in eukaryotic cells (including: the nucleus, plasma membrane, cell wall, mitochondria, vacuoles, chloroplasts, and ribosomes) and ways that these organelles interact with each other to perform the function of the cell.	Cell 5, 6	5 AQ 1 UC 6 AQ 4 UC
Bio.1.1.2	Compare prokaryotic and eukaryotic cells in terms of their general structures (plasma membrane and genetic material) and degree of complexity.	Cell 4	AQ 4 AQ 2 UC
Bio.1.1.3	Explain how instructions in DNA lead to cell differentiation and result in cells specialized to perform specific functions in multicellular organisms.	Gen 17	17 AQ 1c, 2, 4, 4-5
Bio.1.2	Analyze the cell as a living system.		
Bio.1.2.1	Explain how homeostasis is maintained in the cell and within an organism in various environments (including: temperature and pH).	Cell 6-8 Organisms not covered	6 AQ 4 UC 7 AQ 1-4 8 AQ 1&2 AD
Bio.1.2.2	Analyze how cells grow and reproduce in terms of interphase, mitosis and cytokinesis.	Cell 13	13 AQ 1-6
Bio.1.2.3	Explain how specific cell adaptations help cells survive in particular environments (focus on unicellular organisms).	Cell 4, 5, 6	4 AQ 2 UC 5 AQ1 UC 6 AQ 4 UC
<i>Ecosystems</i>			
Bio.2.1	Analyze the interdependence of living organisms within their environments.		
Bio.2.1.1	Analyze the flow of energy and cycling of matter (water, carbon, nitrogen and oxygen) through ecosystems relating the significance of each to maintaining the health and sustainability of an ecosystem.	Eco 7, 8, 9	7 AQ 2, 3, 4 UC 8 AQ 3 UC 9 AQ 3&6 UC
Bio.2.1.2	Analyze the survival and reproductive success of organisms in terms of behavioral, structural, and reproductive adaptations.	Evo 13	13 AQ 1-3
Bio.2.1.3	Explain various ways organisms interact with	Eco 13, 14	13 AQ 1-4

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	each other (including predation, competition, parasitism, mutualism) and with their environments resulting in stability within ecosystems.		14 AQ 1 UC
Bio.2.1.4	Explain why ecosystems can be relatively stable over hundreds or thousands of years, even though populations may fluctuate (emphasizing availability of food, availability of shelter, number of predators and disease).	Eco 17	17 AQ 1-4
Bio.2.2	Understand the impact of human activities on the environment (one generation affects the next).		
Bio.2.2.1	Infer how human activities (including population growth, pollution, global warming, burning of fossil fuels, habitat destruction and introduction of nonnative species) may impact the environment.	Eco 4, 8, 16, 17	4 AQ 4 ET 8 AQ 3 UC 16 AQ 5 ED, AQ 1 UC 17 AQ 1, 2 UC
Bio.2.2.2	Explain how the use, protection and conservation of natural resources by humans impact the environment from one generation to the next.	Eco 18, 19	18 AQ 1-4 19 AQ 3 UC
Evolution and Genetics			
Bio.3.1	Explain how traits are determined by the structure and function of DNA.		
Bio.3.1.1	Explain the double-stranded, complementary nature of DNA as related to its function in the cell.	Gen 10, 16	10 AQ 1-4 16 Proc UC
Bio.3.1.2	Explain how DNA and RNA code for proteins and determine traits	Gen 16	16 Proc UC
Bio.3.1.3	Explain how mutations in DNA that result from interactions with the environment (i.e. radiation and chemicals) or new combinations in existing genes lead to changes in function and phenotype.	Gen 13, 14	13 AQ 3 14 AQ 1 UC
Bio.3.2	Understand how the environment, and/or the interaction of alleles, influences the expression of genetic traits.		
Bio.3.2.1	Explain the role of meiosis in sexual reproduction and genetic variation.	Gen 13, 14	13 AQ 3 14 AQ 1 UC
Bio.3.2.2	Predict offspring ratios based on a variety of inheritance patterns (including: dominance, co-dominance, incomplete dominance, multiple alleles, and sex-linked traits).	Gen 5, 6, 7	5 AQ 1-4 6 AQ 1-3 7 AQ 1-6

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Bio.3.2.3	Explain how the environment can influence the expression of genetic traits.	Evo 12	12 AQ 1-4
Bio.3.3	Understand the application of DNA technology.		
Bio.3.3.1	Interpret how DNA is used for comparison and identification of organisms.	Gen 18	18 AQ 2 CS
Bio.3.3.2	Summarize how transgenic organisms are engineered to benefit society.	Gen 16, 17, 19	16 Proc UC 17 AQ 6-7 19 AQ 1-3
Bio.3.3.3	Evaluate some of the ethical issues surrounding the use of DNA technology (including: cloning, genetically modified organisms, stem cell research, and Human Genome Project).	Gen 15, 16, 17, 18, 19	15 Proc CS 16 Proc UC 17 AQ 6-7 18 AQ 2 CS 19 AQ 1-3
Bio.3.4	Explain the theory of evolution by natural selection as a mechanism for how species change over time.		
Bio.3.4.1	Explain how fossil, biochemical, and anatomical evidence support the theory of evolution.	Evo 5, 6, 7, 8	5 AQ 1-5 6 AQ 1-3 7 AQ 1-4 8 AQ 1-3
Bio.3.4.2	Explain how natural selection influences the changes in species over time.	Evo 3, 4, 11	3 AQ 1 UC & CS 4 AQ 1-3 11
Bio.3.4.3	Explain how various disease agents (bacteria, viruses, chemicals) can influence natural selection.	Evo 13	13 AQ 2-4
Bio 3.5	Analyze how classification systems are developed based upon speciation.		
Bio.3.5.1	Explain the historical development and changing nature of classification systems.	Appendix G Evo 5, 6	5 AQ 1-5 6 AQ 1-3
Bio.3.5.2	Analyze the classification of organisms according to their evolutionary relationships (including: dichotomous keys and phylogenetic trees).	Appendix G	
Molecular Biology			
Bio.4.1	Understand how biological molecules are essential to the survival of living organisms		
Bio.4.1.1	Compare the structures and functions of the major biological molecules (carbohydrates, proteins, lipids, and nucleic acids) as related to	Cell 9, 10	9 AQ 3, 5, 6 UC 10 AQ 3 UC,

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	the survival of living organisms.		Proc CS
Bio.4.1.2	Summarize the relationship among DNA, proteins and amino acids in carrying out the work of cells and how this is similar in all organisms.	Gen 16	16 Proc UC
Bio.4.1.3	Explain how enzymes act as catalysts for biological reactions.	Cell 11	11 AQ 4 AD
Bio 4.2	Analyze the relationships between biochemical processes and energy use in the cell.		
Bio.4.2.1	Analyze photosynthesis and cellular respiration in terms of how energy is stored, released, and transferred within and between these systems.	Cell 12	12 AQ 8 UC
Bio.4.2.2	Explain ways that organisms use released energy for maintaining homeostasis (active transport).	Cell 8, 9	8 AQ 1&2 AD 9 AQ 3, 5, 6 UC