Lab-Aids Correlations for

NEXT GENERATION SCIENCE STANDARDS

HIGH SCHOOL LEVEL, LIFE SCIENCE

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This document is intended to show the alignment of *Science and Global Issues: Biology* with the *Next Generation Science Standards*.

ABOUT OUR PROGRAMS
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 assessment programs that clearly show what students know and are able to do as a result of program use. 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.

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. Since 1987, development of SEPUP materials has been supported by grants from the National Science Foundation and other public and private sources. SEPUP programs include student books, equipment kits, teacher materials, and online digital content, and are available as full year courses, or separately, as units.

ABOUT THE NEXT GENERATION SCIENCE STANDARDS

The National Academy of Sciences, Achieve, the American Association for the Advancement of Science, and the National Science Teachers Association have collaborated over several years to develop the *Next Generation Science Standards* (NGSS). The first step of the process was led by The National Academies of Science, a non-governmental organization commissioned in 1863 to advise the nation on scientific and engineering issues. On July 19, 2011, the National Research Council (NRC), the functional staffing arm of the National Academy of Sciences, released the *Framework for K-12 Science Education*.

The *Framework* was a critical first step because it is grounded in the most current research on science and science learning, and it identifies the science all K–12 students should know. The second step in the process was the development of standards grounded in the NRC Framework. A group of 26 lead states and writers, in a process managed by Achieve, has been working since the release of the Framework to develop K-12 *Next Generation Science Standards*. The final release of the Standards was in April 2013. States, districts, and schools have worked to implement these standards since then.

The *Next Generation Science Standards* (NGSS) provide an important opportunity to improve not only science education but also student achievement. Based on the *Framework*, the NGSS are intended to reflect a new vision for American science education. *The Next Generation Science Standards* are student performance expectations – not curriculum. These performance expectations clarify the expectations of what students will know and be able to do by the end of the grade or grade band.

As the reader knows, the *NGSS* represent content from several domains: (1) science and engineering practices; (2) crosscutting concepts; (3) the disciplines of life, earth, and physical science, as set forth in the *Next Generation Science Framework* (NRC, 2012). The Standards themselves are written as performance indicators, and content from the Common Core (http://www.corestandards.org/) is included. The following high school level standard from the life sciences is used to show the basic structure. Standards, as performance indicators, are in the white box on top, and the relevant Practices, Disciplinary Core Ideas, and Crosscutting Concepts are listed below in the blue, orange, and green boxes, respectively. Clarification Statements, in red, list assessment boundaries or further describe the standard.

Various other appendices from the Standards documents describe other important elements, such as DCI progressions, STS, nature of science, and more.

HS-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. [*Assessment Boundary: Assessment does not include identification of specific cell or tissue types, whole body systems, specific protein structures and functions, or the biochemistry of protein synthesis.*]

The performance expectation above was developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in 9–12 builds on K–8 experiences and progresses to explanations and designs that are supported by multiple and independent student-generated sources of evidence consistent with scientific ideas, principles, and theories. • Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.	**LS1.A: Structure and Function** • Systems of specialized cells within organisms help them perform the essential functions of life. • All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. *(Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)*	**Structure and Function** • Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.

Connections to other DCIs in this grade-band:
HS.LS3.A

Articulation of DCIs across grade-bands:
MS.LS1.A ; MS.LS3.A ; MS.LS3.B

Common Core State Standards Connections:
ELA/Literacy -
RST.11-12.1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (HS-LS1-1)
WHST.9-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS1-1)
WHST.9-12.9 Draw evidence from informational texts to support analysis, reflection, and research. (HS-LS1-1)

ABOUT THE LAB-AIDS CITATIONS

Citations included in the correlation document are as follows:

* indicates where Performance Expectation is assessed
Unit title, Activity Number
Cells: 2, 3, 4, 5, 6*, 7*, 8

NGSS Performance Expectations	HS-LS1-1
Disciplinary Core Ideas	LS1.A
Science and Engineering Practices	Constructing Explanations and Designing Solutions
Crosscutting Concepts	Scale, Proportion, and Quantity
Common Core ELA	SL.11-12.5
Common Core Math	MP.4

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
HS-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.	Cells: 6	LS1.A	Constructing Explanations and Designing Solutions Developing and Using Models	Scale, Proportion, and Quantity Structure and Function Systems and System Models	ELA/Literacy: SL.11-12.5 WHST.9-12.9
	Genetics: 2, 7, 8, 9, 10*, 15	LS1.A LS1.B LS4.B LS4.C	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions Developing and Using Models Obtaining, Evaluating, and Communicating Information	Cause and Effect Patterns Scale, Proportion, and Quantity Structure and Function Systems and System Models	ELA/Literacy: WHST.9-12.2 WHST.9-12.9 Mathematics: MP.4
HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions	Cells: 2, 3, 4, 5, 6*, 7*, 8	LS1.A	Analyzing and Interpreting Data Connections to Nature of Science	Cause and Effect Scale, Proportion, and Quantity	ELA/Literacy: RST.9-10.1 RST.9-10.7 RST.11-12.3 RST.11-12.9 SL.11-12.5

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
within multicellular organisms.			Constructing Explanations and Designing Solutions Developing and Using Models Planning and Carrying Out Investigations	Stability and Change Structure and Function Systems and System Models	WHST.9-12.9
HS-LS1-3: Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	*Cells: 1, 2, 3, 4, 5, 7, 8, 9*	LS1.A LS1.C ETS1.B	Analyzing and Interpreting Data Asking Questions and Defining Problems Connections to Nature of Science Constructing Explanations and Designing Solutions Developing and Using Models Planning and Carrying Out Investigations	Cause and Effect Energy and Matter Patterns Scale, Proportion, and Quantity Stability and Change Systems and System Models	ELA/Literacy: RST.9-10.1 RST.9-10.7 RST.11-12.3 RST.11-12.7 RST.11-12.9

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
HS-LS1-4: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	*Genetics: 3, 8**	LS1.A LS1.B LS3.A	Developing and Using Models	Systems and Systems Models Structure and Function	Mathematics: MP.4
HS-LS1-5: Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.	*Cells: 11*, 12, 13, 15*	LS1.C LS1.B	Connections to Nature of Science Constructing Explanations and Designing Solutions Developing and Using Models Planning and Carrying Out Investigations Using Mathematics and Computational Thinking	Cause and Effect Connections to Nature of Science Energy and Matter Patterns Scale, Proportion, and Quantity Stability and Change	ELA/Literacy: RST.9-10.1 RST.11-12.3 RST.11-12.7 WHST.9-12.9 Mathematics: MP.2
HS-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	*Cells: 9, 10, 11, 13, 14, 15, 16**	LS1.A LS1.C LS2.B ETS1.B	Analyzing and Interpreting Data Connections to Nature of Science	Cause and Effect Connections to Nature of Science Energy and Matter	ELA/Literacy: RST.9-10.1 RST.11-12.3 RST.11-12.7 WHST.9-12.2 WHST.9-12.9 Mathematics:

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
other large carbon-based molecules.			Constructing Explanations and Designing Solutions

Developing and Using Models

Engaging in Argument from Evidence

Planning and Conducting Investigations

Using Mathematics and Computational Thinking | Patterns

Scale, Proportion, and Quantity

Stability and Change

Systems and System Models | MP.2 |
| **HS-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. | *Cells: 9, 10, 14, 15*, 16* | LS1.A

LS1.C

LS2.B

ETS1.B | Analyzing and Interpreting Data

Connections to Nature of Science

Constructing Explanations and Designing Solutions

Developing and Using Models | Cause and Effect

Energy and Matter

Scale, Proportion, and Quantity

Patterns

Systems and System Models | ELA/Literacy: RST.11-12.3 RST.11-12.7 WHST.9-12.2 WHST.9-12.9 |

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
			Engaging in Argument from Evidence Planning and Conducting Investigations		
HS-LS2-1: Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.	*Ecology: 1, 2, 3*, 4*	LS2.A LS2.C	Analyzing and Interpreting Data Asking Questions and Defining Problems Constructing Explanations and Designing Solutions Developing and Using Models Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Cause and Effect Patterns Scale, Proportion, and Quantity Stability and Change Systems and System Models	ELA/ Literacy: RST.11-12.5 Mathematics: MP.2 MP.4 HSN.Q.A.1 HSN.Q.A.2 HSS-IC.A.1
HS-LS2-2: Use mathematical representations to support and revise explanations based on evidence about factors	*Ecology: 3, 4, 5**	LS2.A LS2.C	Analyzing and Interpreting Data Connections	Cause and Effect Patterns	ELA/ Literacy: RST.11-12.5 Mathematics: MP.2

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
affecting biodiversity and populations in ecosystems of different scales.			to Nature of Science: Scientific Knowledge is Open to Revision in Light of New Evidence Constructing Explanations and Designing Solutions Developing and Using Models Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Scale, Proportion, and Quantity Systems and System Models	MP.4 HSN.Q.A.1 HSN.Q.A.2 HSS-IC.A.1
HS-LS2-3: Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.	*Ecology: 6, 7, 8**	LS2.B	Constructing Explanations and Designing Solutions Connections to Nature of Science: Knowledge is	Energy and Matter	ELA/ Literacy: RST.11-12.7 RST.11-12.9

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
			Open to Revision in Light of New Evidence Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Scale, Proportion, and Quantity	
	Cells: 10, 15*	LS1.C LS2.B	Connections to Nature of Science Constructing Explanations and Designing Solutions Developing and Using Models Engaging in Argument from Evidence	Energy and Matter Scale, Proportion, and Quantity Systems and System Models	ELA/Literacy: RST.11-12.3 WHST.9-12.9
HS-LS2-4: Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.	*Ecology: 6, 7, 9, 10**	LS2.B	Constructing Explanations and Designing Solutions Developing and Using Models	Energy and Matter Scale, Proportion, and Quantity Systems and System Models	ELA/ Literacy: RST.11-12.7 RST.11-12.9 Mathematics: MP.2 MP.4

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
			Engaging in Argument from Evidence Using Mathematics and Computational Thinking		
HS-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.	*Ecology: 11, 12**	LS2.B PS3.D	Analyzing and Interpreting Data Developing and Using Models	Energy and Matter Systems and System Models	ELA/ Literacy: RST.11-12.5 Mathematics: MP.2 MP.4
HS-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.	*Ecology: 13, 14*, 15, 16*	LS2.A LS2.C LS4.D ETS1.A ETS1.B	Constructing Explanations and Designing Solutions Engaging in Argument from Evidence Connections to Nature of Science: Scientific Knowledge is Open to	Cause and Effect Stability and Change	ELA/ Literacy: RST.11-12.5 RST.11-12.7 RST.11-12.9 WHST.9- 12.1 WHST.9- 12.7 Mathematics: MP.2 HSS-IC.B.6

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
			Revision in Light of New Evidence Obtaining, Evaluating, and Communicating Information		
HS-LS2-7: Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	*Ecology: 13, 14, 15, 16, 17**	LS2.A LS2.C LS4.D ETS1.A ETS1.B S2.C	Constructing Explanations and Designing Solutions Engaging in Argument from Evidence Connections to Nature of Science: Scientific Knowledge is Open to Revision in Light of New Evidence Obtaining, Evaluating, and Communicating Information	Cause and Effect Stability and Change	ELA/ Literacy: RST.11-12.5 RST.11-12.7 RST.11-12.9 WHST.9- 12.1 WHST.9- 12.7 Mathematics: MP.2 HSS-IC.B.6
	Cells: 1, 2, 3, 7, 13, 17	LS1.A LS1.C LS2.B ETS1.B	Asking Questions and Defining Problems Constructing Explanations and Designing Solutions	Cause and Effect Connections to Nature of Science Energy and Matter	ELA/ Literacy: RST.9-10.1 RST.11-12.3 RST.11-12.7 SL.11-12.5 Mathematics:

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
			Developing and Using Models

Planning and Carrying Out Investigations

Using Mathematics and Computational Thinking | Patterns

Scale, Proportion, and Quantity

Stability and Change

Systems and System Models | MP.2 |
| | *Genetics: 16, 17* | LS2.C

LS4.B

LS4.C

LS4.D

ETS1.B | Analyzing and Interpreting Data

Constructing Explanations and Designing Solutions | Patterns

Stability and Change | ELA/ Literacy: RST.11-12.8 WHST.9- 12.9 |
| | *Evolution: 10, 13, 14*, 15** | ETS1.B

LS2.C

LS4.A

LS4.B

LS4.C | Constructing Explanations and Designing Solutions

Obtaining, Evaluating, and Communicating Information

Using Mathematics and Computational Thinking | Cause and Effect

Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on | ELA/ Literacy: RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8 SL.11-12.4 WHST.9- 12.2 WHST.9- 12.7

Mathematics: HSN.QA.1 |

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
		LS4.D		Society and the Natural World

Patterns

Stability and Change

Systems and System Models | MP.2
MP.4 |
| **HS-LS2-8:** Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. | *Evolution: 1, 3** | LS2.D

LS4.B

LS4.C | Analyzing and Interpreting Data

Connections to Nature of Science: Scientific Knowledge is Open to Revision in Light of New Evidence

Constructing Explanations and Designing Solutions

Engaging in Argument from Evidence | Cause and Effect

Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems

Patterns | ELA/Literacy:
RST.9-12.2
RST.11-12.1
RST.11-12.7
RST.11-12.8

Mathematics:
MP.2
MP.4 |
| **HS-LS3-1:** Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions | *Genetics: 4, 5, 7, 10, 11*, 12** | LS1.A

LS3.A

LS3.B | Analyzing and Interpreting Data | Cause and Effect

Scale, Proportion, and Quantity | ELA/Literacy:
RST.11-12.1
RST.11-12.9
WHST.9-12.1
WHST.9-12.2 |

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
for characteristic traits passed from parents to offspring.			Asking Questions and Defining Problems Constructing Explanations and Designing Solutions Developing and Using Models Engaging in Argument from Evidence Using Mathematics and Computational Thinking	Structure and Function Systems and System Models	WHST.9-12.9 Mathematics: MP.2
HS-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.	*Genetics: 1, 6, 11, 12, 13**	LS1.A LS3.A LS3.B	Analyzing and Interpreting Data Asking Questions and Defining Problems Developing and Using Models Engaging in Argument from Evidence	Cause and Effect Scale, Proportion, and Quantity Systems and System Models	ELA/Literacy: RST.11-12.1 RST.11-12.9 WHST.9-12.1 WHST.9-12.2 WHST.9-12.9 Mathematics: MP.2
HS-LS3-3: Apply concepts of statistics and probability to explain the	*Genetics: 4, 5, 6*, 14**	LS3.A	Analyzing and Interpreting Data	Cause and Effect	ELA/Literacy: RST.11-12.1 RST.11-12.9

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
variation and distribution of expressed traits in a population.		LS3.B LS4.B LS4.C	Asking Questions and Defining Problems Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Patterns Scale, Proportion, and Quantity	WHST.9-12.1 WHST.9-12.9 Mathematics: MP.2
HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.	*Evolution: 6, 7, 8, 9, 10*	LS2.C LS4.A LS4.B LS4.C LS4.D	Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information	Cause and Effect Patterns Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems Scale, Proportion, and Quantity Stability and Change	ELA/Literacy: RST.11-12.1 RST.11-12.7 RST.11-12.8 SL.11-12.4 WHST.9-12.2 WHST.9-12.9 Mathematics: MP.2

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
HS-LS4-2: Construct an explanation based on evidence that the process of evolution primarily results from four factors: (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.	*Evolution: 1, 2, 3, 4, 5*, 6, 12*	LS2.D LS4.A LS4.B LS4.C LS4.D	Analyzing and Interpreting Data Connections to Nature of Science: Scientific Knowledge is Open to Revision in Light of New Evidence Constructing Explanations and Designing Solutions Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Cause and Effect Patterns Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems	ELA/Literacy: RST.11-12.1 RST.11-12.7 RST.11-12.8 SL.11-12.4 WHST.9-12.2 WHST.9-12.9 Mathematics: MP.2 MP.4
HS-LS4-3: Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in	*Genetics: 14, 15, 16*	LS1.A LS2.C LS3.B LS4.B	Analyzing and Interpreting Data Asking Questions and Defining Problems	Patterns Scale, Proportion, and Quantity Stability and Change	ELA/Literacy: RST.11-12.8 WHST.9-12.9 Mathematics: MP.2

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
proportion to organisms lacking this trait.		LS4.C LS4.D ETS1.B	Constructing Explanations and Designing Solutions Obtaining, Evaluating, and Communicating Information	Structure and Function	
	Evolution: 1, 2, 3, 4, 5, 6*	LS2.D LS4.A LS4.B LS4.C	Analyzing and Interpreting Data Connections to Nature of Science: Scientific Knowledge is Open to Revision in Light of New Evidence Constructing Explanations and Designing Solutions Engaging in Argument from Evidence Using Mathematics and Computational Thinking	Cause and Effect Patterns Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems	ELA/Literacy: RST.11-12.1 RST.11-12.7 RST.11-12.8 SL.11-12.4 WHST.9-12.2 WHST.9-12.9 Mathematics: MP.2 MP.4
HS-LS4-4: Construct an explanation based on evidence for how natural selection leads to	*Evolution: 1, 2, 3, 4, 5, 6*, 11, 12*	LS2.D LS4.A	Analyzing and Interpreting Data Connections to Nature of Science: Scientific	Cause and Effect Patterns	ELA/Literacy: RST.11-12.1 RST.11-12.7 RST.11-12.8 SL.11-12.4

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
adaptation of populations.		LS4.B LS4.C LS4.D	Knowledge is Open to Revision in Light of New Evidence Constructing Explanations and Designing Solutions Developing and Using Models Engaging in Argument from Evidence Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Connections to Nature of Science: Scientific Knowledge Assumes an Order and Consistency in Natural Systems	WHST.9-12.2 WHST.9-12.9 Mathematics: MP.2 MP.4
HS-LS 4-5: 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)	*Evolution: 6, 7, 8*, 9, 10*	LS2.C LS4.A LS4.B LS4.C LS4.D	Analyzing and Interpreting Data Constructing Explanations and Designing Solutions Engaging in Argument from Evidence	Cause and Effect Patterns Connections to Nature of Science: Scientific Knowledge Assumes an Order	ELA/Literacy: RST.11-12.1 RST.11-12.7 RST.11-12.8 SL.11-12.4 WHST.9-12.2 WHST.9-12.9 Mathematics:

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
the extinction of other species.			Obtaining, Evaluating, and Communicating Information	and Consistency in Natural Systems Scale, Proportion, and Quantity Stability and Change	MP.2
HS-LS4-6: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.	*Evolution: 12, 13, 14**	ETS1.B LS2.C LS4.B LS4.C LS4.D	Constructing Explanations and Designing Solutions Obtaining, Evaluating, and Communicating Information Using Mathematics and Computational Thinking	Cause and Effect Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on Society and the Natural World Patterns Stability and Change Systems and System Models	ELA/Literacy: RST.11-12.7 RST.11-12.8 WHST.9-12.7 Mathematics: HSN.QA.1 MP.2 MP.4

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
HS-ETS1-3: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.	*Evolution: 13, 14**	ETS1.B LS2.C LS4.B LS4.C LS4.D	Constructing Explanations and Designing Solutions Using Mathematics and Computational Thinking	Cause and Effect Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on Society and the Natural World Stability and Change Systems and System Models	ELA/Literacy: RST.11-12.8 WHST.9-12.7 Mathematics: HSN.QA.1 MP.2 MP.4
HS-ETS1-4: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.	*Evolution: 13, 14**	ETS1.B LS2.C LS4.B LS4.C LS4.D	Constructing Explanations and Designing Solutions Using Mathematics and Computational Thinking	Cause and Effect Connections to Engineering, Technology, and Applications of Science: Influence of Science, Engineering, and Technology on	ELA/Literacy: RST.11-12.8 WHST.9-12.7 Mathematics: HSN.QA.1 MP.2 MP.4

Performance Expectation	SGI Biology: Unit and Activity Number	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts	Common Core ELA/Math
				Society and the Natural World Stability and Change Systems and System Models	