

STATE CONTENT STANDARDS/BENCHMARKS

This unit of study address all of the following content and literacy standards. Please select the ones appropriate for your planning purposes.

4th Grade

Strand: Life and Environment Sciences	
Standard 3: Life and Environmental Sciences: ORGANISMS AND THE ENVIRONMENT: Understand the unity, diversity, and interrelationships of organisms, including their relationship to cycles of matter and energy in the environment	
Standard 4: Life and Environmental Sciences: STRUCTURE AND FUNCTION IN ORGANISMS: Understand the structures and functions of living organisms and how organisms can be compared scientifically	
Topic	Interdependence
Benchmark SC.4.3.2	Describe how an organism's behavior is determined by its environment
Sample Performance Assessment (SPA)	The student: Describes how an organism's behavior is affected by its environment (e.g., courting, nesting, feeding patterns).

Standard 5: Life and Environmental Sciences: DIVERSITY, GENETICS, AND EVOLUTION: Understand genetics and biological evolution and their impact on the unity and diversity of organisms	
Topic	Unity and Diversity
Benchmark SC.4.5.2	Describe the roles of various organisms in the same environment
Sample Performance Assessment (SPA)	The student: Describes the roles (e.g., decomposers, producers, consumers) of various organisms that inhabit the same environment.

Topic	Unity and Diversity
Benchmark SC.4.5.3	Describe how different organisms need specific environmental conditions to survive
Sample Performance Assessment (SPA)	The student: Illustrates and explains how specific environmental conditions support the survival of specific organisms.

5th Grade

Strand: Life and Environmental Sciences	
Standard 5: Life and Environmental Sciences: DIVERSITY, GENETICS, AND EVOLUTION: Understand genetics and biological evolution and their impact on the unity and diversity of organisms	
Topic	Heredity
Benchmark SC.5.5.1	Recognize that some traits of living things are inherited and others are learned
Sample Performance Assessment (SPA)	The student: recall inherited traits (e.g. eye color, flower color) and learned characteristics (e.g. riding a bicycle)

6th Grade

Strand: The Scientific Process	
Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION: Discover, invent, and investigate using the skills necessary to engage in the scientific process.	
Topic	Scientific Inquiry
Benchmark SC.6.1.1	Formulate a testable hypothesis that can be answered through a controlled experiment
Sample Performance Assessment (SPA)	The student: Constructs a hypothesis (e.g., if, then, and because statement) that is tested through a controlled experiment.

7th Grade

Strand: The Scientific Process	
Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION: Discover, invent, and investigate using the skills necessary to engage in the scientific process.	
Topic	Scientific Knowledge
Benchmark SC.7.1.3	Explain the need to revise conclusions and explanations based on new scientific evidence
Sample Performance Assessment (SPA)	The student: Explains why conclusions and explanations need to be revised, based on new evidence in a journal article and/or published scientific evidence.

Strand: Life and Environmental Sciences	
Standard 3: Life and Environmental Sciences: ORGANISMS AND THE ENVIRONMENT: Understand the unity, diversity, and interrelationships of organisms, including their relationships to cycles of matter and energy in the environment.	
Topic	Interdependence
Benchmark SC.7.3.2	Explain the interaction and dependence of organisms on one another
Sample Performance Assessment (SPA)	The student: Explains how organisms in a biological community interact (e.g., predator/prey, producer/consumer, parasitism, mutualism, competition, cooperation, niche).

Standard 4: Life and Environmental Sciences: STRUCTURE AND FUNCTION IN ORGANISMS: Understand the structure and function of living organisms and how organisms can be compared scientifically	
Topic	Classification
Benchmark SC.7.3.2	Classify organisms according to their degree of relatedness
Sample Performance Assessment (SPA)	The student: Analyzes the degree of relatedness among selected organisms by comparing the similarities and differences found in internal and external anatomical features.

8th Grade

Strand: The Scientific Process	
Standard 1: The Scientific Process: SCIENTIFIC INVESTIGATION: Discover, invent, and investigate using the skills necessary to engage in the scientific process.	
Topic	Scientific Inquiry
Benchmark SC.8.1.1	Determine the link(s) between evidence and the conclusion(s) of an investigation
Sample Performance Assessment (SPA)	The student: Determines if the conclusion(s) and evidence from an experiment or other sources are logically linked.

Strand: Life and Environmental Sciences	
Standard 5: Life and Environmental Sciences: DIVERSITY, GENETICS, AND EVOLUTION: Understand genetics and biological evolution and their impact on the unity and diversity of organisms	
Topic	Biological Evolution
Benchmark SC.8.5.1	Describe how changes in the physical environment affect the survival of organisms
Sample Performance Assessment (SPA)	The student: Explains how organisms respond (e.g., some organisms adapt, some move out, others die) to changes in the physical environment, such as tsunamis and hurricanes.

9th-12th Grades

HS-LS2-6. Evaluate 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. [Clarification Statement: Examples of changes in ecosystem conditions could include modest biological or physical changes, such as moderate hunting or a seasonal flood; and extreme changes, such as volcanic eruption or sea level rise.]

Science and Engineering Practices

Engaging in argument from evidence in 9–12 builds on K–8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current scientific or historical episodes in science.

- Evaluate the claims, evidence, and reasoning behind currently accepted explanations or solutions to determine the merits of arguments.
- Scientific argumentation is a mode of logical discourse used to clarify the strength of relationships between ideas and evidence that may result in revision of an explanation.

Disciplinary Core Ideas

- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable

conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.

Crosscutting Concepts

- Much of science deals with constructing explanations of how things change and how they remain stable.

HS-
LS2-
7.

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.*[Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]

Science and Engineering Practices

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.

- Design, evaluate, and refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Disciplinary Core Ideas

- A complex set of interactions within an ecosystem can keep its numbers and types of organisms relatively constant over long periods of time under stable conditions. If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient), as opposed to becoming a very different ecosystem. Extreme fluctuations in conditions or the size of any population, however, can challenge the functioning of ecosystems in terms of resources and habitat availability.

Crosscutting Concepts

- Much of science deals with constructing explanations of how things change and how they remain stable.

HS-
LS4-
1.

Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. [Clarification Statement: Emphasis is on a conceptual understanding of the role each line of evidence has relating to common ancestry and biological evolution. Examples of evidence could include similarities in DNA sequences, anatomical structures, and order of appearance of structures in embryological development.]

Science and Engineering Practices

Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs.

· Communicate scientific information (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically).

· A scientific theory is a substantiated explanation of some aspect of the natural world, based on a body of facts that have been repeatedly confirmed through observation and experiment and the science community validates each theory before it is accepted. If new evidence is discovered that the theory does not accommodate, the theory is generally modified in light of this new evidence.

Disciplinary Core Ideas

· Genetic information, like the fossil record, provides evidence of evolution. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence.

Crosscutting Concepts

· Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

· Scientific knowledge is based on the assumption that natural laws operate today as they did in the past and they will continue to do so in the future.

HS-
LS4-
4.

Construct an explanation based on evidence for how natural selection leads to adaptation of populations. [Clarification Statement: Emphasis is on using data to provide evidence for how specific biotic and abiotic differences in ecosystems (such as ranges of seasonal temperature, long-term climate change, acidity, light, geographic barriers, or evolution of other organisms) contribute to a change in gene frequency over time, leading to adaptation of populations.]

Science and Engineering Practices

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.

Disciplinary Core Ideas

- Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment. That is, the differential survival and reproduction of organisms in a population that have an advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not.

Crosscutting Concepts

- Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.
- Scientific knowledge is based on the assumption that natural laws operate today as they did in the past and they will continue to do so in the future.

- HS-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. [Clarification Statement: Emphasis is on determining cause and effect relationships for how changes to the environment such as deforestation, fishing, application of fertilizers, drought, flood, and the rate of change of the environment affect distribution or disappearance of traits in species.]

Science and Engineering Practices

Engaging in argument from evidence in 9-12 builds on K-8 experiences and progresses to using appropriate and sufficient evidence and scientific reasoning to defend and critique claims and explanations about the natural and designed world(s). Arguments may also come from current or historical episodes in science.

- Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments.

Disciplinary Core Ideas

- Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline—and sometimes the extinction—of some species.
- Species become extinct because they can no longer survive and reproduce in their altered environment. If members cannot adjust to change that is too fast or drastic, the opportunity for the species' evolution is lost.

Crosscutting Concepts

- Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

LITERACY COMMON CORE STATE STANDARD

4th & 5th Grade

[CCSS.ELA-Literacy.RL.4.4](#)

[CCSS.ELA-Literacy.RL.5.4](#)

Determine the meaning of words and phrases as they are used in a text.

6th & 8th Grade ELA Literacy

[CCSS.ELA-Literacy.RL.6.1](#)

Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

[CCSS.ELA-Literacy.RL.6.2](#)

Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

[CCSS.ELA-Literacy.RST.6-8.1](#)

Cite specific textual evidence to support analysis of science and technical texts.

[CCSS.ELA-Literacy.RST.6-8.2](#)

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

[CCSS.ELA-Literacy.RST.6-8.3](#)

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

[CCSS.ELA-Literacy.RST.6-8.4](#)

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

[CCSS.ELA-Literacy.RST.6-8.7](#)

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

[CCSS.ELA-Literacy.RST.6-8.8](#)

Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

[CCSS.ELA-Literacy.RST.6-8.9](#)

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

9th & 10th Grade Reading Science and Technical

[CCSS.ELA-Literacy.RST.9-10.4](#)

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9-10 texts and topics*.

[CCSS.ELA-Literacy.RST.9-10.5](#)

Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*).

[CCSS.ELA-Literacy.RST.9-10.6](#)

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address

11th & 12th Grade Reading Science and Technical

[CCSS.ELA-Literacy.RST.11-12.7](#)

Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

[CCSS.ELA-Literacy.RST.11-12.8](#)

Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

[CCSS.ELA-Literacy.RST.11-12.4](#)

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.

[CCSS.ELA-Literacy.RST.11-12.5](#)

Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.

[CCSS.ELA-Literacy.RST.11-12.6](#)

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved

[CCSS.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.

[CCSS.ELA-Literacy.RST.11-12.2](#)

Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

[CCSS.ELA-Literacy.RST.11-12.3](#)

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.