



ORGANIZING THEME/TOPIC

FOCUS STANDARDS & SKILLS

<p>UNIT 1: PRAIRIE/GRASSLANDS Flora Fauna Human Impact</p> <p>UNIT 2: FRESH WATER Fauna Human Impact</p> <p>UNIT 3: FOREST Flora Fauna Human Impact</p>	<p>HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.</p> <p>Science & Engineering Practice (s):</p> <ul style="list-style-type: none">• Using Mathematics and Computational Thinking: Use mathematical representations of phenomena or design solutions to support claims. <p>Disciplinary Core Idea (s):</p> <ul style="list-style-type: none">• LS2.B: Cycles of Matter and Energy Transfer in Ecosystems: Plants or algae form the lowest level of the food web. At each link upward in a food web, only a small fraction of the matter consumed at the lower level is transferred upward, to produce growth and release energy in cellular respiration at the higher level. Given this inefficiency, there are generally fewer organisms at higher levels of a food web. Some matter reacts to release energy for life functions, some matter is stored in newly made structures, and much is discarded. The chemical elements that make up the molecules of organisms pass through food webs and into and out of the atmosphere and soil, and they are combined and recombined in different ways. At each link in an ecosystem, matter and energy are conserved. <p>Crosscutting Concept (s):</p> <ul style="list-style-type: none">• Energy and Matter: Energy cannot be created or destroyed—it only moves between one place and another place, between objects and/or fields, or between systems.
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<p>UNIT 1: PRAIRIE/GRASSLANDS Flora Fauna Human Impact</p> <p>UNIT 2: FRESH WATER Fauna Human Impact</p> <p>UNIT 3: FOREST Flora Fauna Human Impact</p>	<p>HS-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.</p> <p><i>Science & Engineering Practice (s):</i></p> <ul style="list-style-type: none"> • Analyzing and Interpreting Data: Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible. <p><i>Disciplinary Core Idea (s):</i></p> <ul style="list-style-type: none"> • LS4.C: Adaptation: Adaptation also means that the distribution of traits in a population can change when conditions change. • LS4.B: Natural Selection: The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. <p><i>Crosscutting Concept (s):</i></p> <ul style="list-style-type: none"> • Patterns: 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. <p>HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.</p> <p><i>Science & Engineering Practice (s):</i></p> <ul style="list-style-type: none"> • Using Mathematics and Computational Thinking: Create or revise a simulation of a phenomenon, designed device, process, or system. <p><i>Disciplinary Core Idea (s):</i></p> <ul style="list-style-type: none"> • LS4.C: Adaptation: 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. <p><i>Crosscutting Concept (s):</i></p> <ul style="list-style-type: none"> • Cause and Effect: Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.
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<p>UNIT 1: PRAIRIE/GRASSLANDS Flora Fauna Human Impact</p> <p>UNIT 2: FRESH WATER Fauna Human Impact</p> <p>UNIT 3: FOREST Flora Fauna Human Impact</p>	<p>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.</p> <p>Science & Engineering Practice (s):</p> <ul style="list-style-type: none">• Engaging in Argument from Evidence: Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments. <p>Disciplinary Core Idea (s):</p> <ul style="list-style-type: none">• LS4.C: Adaptation: 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. (HS-LS4-5) <p>Crosscutting Concept (s):</p> <ul style="list-style-type: none">• Cause and Effect: Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.
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<p>ENDANGERED SPECIES PROJECT</p> <p>Flora Fauna Human Impact</p>	<p>HS-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.</p> <p><i>Science & Engineering Practice (s):</i></p> <ul style="list-style-type: none"> • Analyzing and Interpreting Data: Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible. <p><i>Disciplinary Core Idea (s):</i></p> <ul style="list-style-type: none"> • LS4.C: Adaptation: Adaptation also means that the distribution of traits in a population can change when conditions change. • LS4.B: Natural Selection: The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. <p><i>Crosscutting Concept (s):</i></p> <ul style="list-style-type: none"> • Patterns: 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. <p>HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.</p> <p><i>Science & Engineering Practice (s):</i></p> <ul style="list-style-type: none"> • Using Mathematics and Computational Thinking: Create or revise a simulation of a phenomenon, designed device, process, or system. <p><i>Disciplinary Core Idea (s):</i></p> <ul style="list-style-type: none"> • LS4.C: Adaptation: 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. <p><i>Crosscutting Concept (s):</i></p> <ul style="list-style-type: none"> • Cause and Effect: Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.
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<p>ENDANGERED SPECIES PROJECT (continued)</p>	<p>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.</p> <p><i>Science & Engineering Practice (s):</i></p> <ul style="list-style-type: none"> • Engaging in Argument from Evidence: Evaluate the evidence behind currently accepted explanations or solutions to determine the merits of arguments. <p><i>Disciplinary Core Idea (s):</i></p> <ul style="list-style-type: none"> • LS4.C: Adaptation: 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. (HS-LS4-5) <p><i>Crosscutting Concept (s):</i></p> <ul style="list-style-type: none"> • Cause and Effect: Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects. <p>HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.</p> <p><i>Science & Engineering Practice (s):</i></p> <ul style="list-style-type: none"> • Constructing Explanations and Designing Solutions: 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. <p><i>Disciplinary Core Idea (s):</i></p> <ul style="list-style-type: none"> • LS2.C: Ecosystem Dynamics, Functioning, and Resilience: Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species. • LS4.D: Biodiversity and Humans: Biodiversity is increased by the formation of new species (speciation) and decreased by the loss of species (extinction). <p><i>Crosscutting Concept (s):</i></p> <ul style="list-style-type: none"> • Stability and Change: Much of science deals with constructing explanations of how things change and how they remain stable.
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