**Correlation of Lawrence Free State Prairie Learning Outcomes with Kansas College & Career Readiness Standards**

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| **Lawrence Free State Prairie Learning Outcomes:****The students will be able to…*** **Identify common, native species of plants and animals in Douglas Co, KS.**
* **Collect quantitative data on the numbers of species and diversity of communities in each of the three treatment plots using random sampling methods.**
* **Incorporate sample data in species-area curves to show changes in species diversity between treatments and over time.**
* **Use appropriate tools and techniques to gather soil core data in collaboration with KU scientists.**
* **Use appropriate tools and techniques to gather insect community data in collaboration with KU scientists.**
* **Estimate the energy flow through a prairie ecosystem using models and calculations using biomass sampling data.**
* **Compile experimental evidence indicating the effects of human application of nitrogen fertilizer on native plant communities.**
* **Monitor changes in community composition in response to plot treatment over time.**
* **Develop questions and design and implement data collection techniques to gather evidence of correlation or cause and effect.**
* **Generate alternative hypotheses about relationships between organisms and between organisms and their environment and test predictions by gathering and analyzing evidence.**
 | **College & Career Readiness (NGSS) Performance Expectations:** Students who demonstrate understanding can:**HS-LS2 Ecosystems: Interactions, Energy, and Dynamics**HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. 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. 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. HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species’ chances to survive and reproduce.**HS-LS4 Biological Evolution: Unity and Diversity**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. HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations.HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases inthe number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species. HS-LS4-6. Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.\***HS-ESS3 Earth and Human Activity**HS-ESS3-3. Create a computational simulation to illustrate the relationships among management of natural resources, thesustainability of human populations, and biodiversity. |
| **NGSS Science & Engineering Practices**Asking Questions and Defining Problems Analyzing and Interpreting DataDeveloping and Using ModelsUsing Mathematics and Computational ThinkingConstructing Explanations and DesigningSolutionsEngaging in Argument from EvidenceObtaining, Evaluating, and Communicating Information | **NGSS Disciplinary Core Ideas**LS2.A: Interdependent Relationships in EcosystemsLS2.B: Cycles of Matter and Energy Transfer in EcosystemsLS2.C: Ecosystem Dynamics, Functioning, and ResilienceLS2.D: Social Interactions and Group BehaviorLS4.B: Natural SelectionLS4.C: AdaptationLS4.D: Biodiversity and HumansPS3.D: Energy in Chemical ProcessesETS1.B: Developing Possible Solutions | **NGSS Crosscutting Concepts**PatternsCause and EffectScale, Proportion, and QuantitySystems and System ModelsEnergy and MatterStability and Change |
| **Other College and Career Readiness Standards Supported by FSHS Prairie Project:****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 orinconsistencies in the account. (HS-LS2-1),(HS-LS2-2),(HS-LS2-3),(HS-LS2-6),(HS-LS2-8)**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 toaddress a question or solve a problem. (HS-LS2-6),(HS-LS2-7),(HS-LS2-8)**RST.9-10.8** Assess the extent to which the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem.(HS-LS2-6),(HS-LS2-7),(HS-LS2-8)**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 challengingconclusions with other sources of information. (HS-LS2-6),(HS-LS2-7),(HS-LS2-8)**WHST.9-12.2** Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. (HS-LS2-1),(HSLS2-2),(HS-LS2-3)**WHST.9-12.5** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significantfor a specific purpose and audience. (HS-LS2-3)**WHST.9-12.7** Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broadenthe inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation. (HS-LS2-7)**Mathematics –****MP.2** Reason abstractly and quantitatively. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-6),(HS-LS2-7)**MP.4** Model with mathematics. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4)**HSN-Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose andinterpret the scale and the origin in graphs and data displays. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-7)**HSN-Q.A.2** Define appropriate quantities for the purpose of descriptive modeling. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-7)**HSN-Q.A.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (HS-LS2-1),(HS-LS2-2),(HS-LS2-4),(HS-LS2-7)**HSS-ID.A.1** Represent data with plots on the real number line. (HS-LS2-6)**HSS-IC.A.1** Understand statistics as a process for making inferences about population parameters based on a random sample from that population. (HS-LS2-6)**HSS-IC.B.6** Evaluate reports based on data. (HS-LS2-6) |