

Mike Govert  
Cathy Govert  
Greeley County Charter School  
Life Science – 7<sup>th</sup>  
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“In the end, our society will be defined not only by what we create, but by what we refuse to destroy”.  
John C. Sawhill

### **Rationale**

A large number of students today, whether from small towns or large cities are losing their connections to rural Kansas. Therefore, the Konza Ed Schoolyard LTER program provides a basis, through environmental science education to strengthen these tenuous connections.

### **Goals**

Through discovery learning students will observe, collect flora and fauna in the Western Kansas shortgrass prairie, and record data in order to determine the diversity of the plants and animals that inhabit the shortgrass ecosystem. This study includes but is not limited to the following:

1. Environmental education and stewardship
2. Applied science skills
3. Connections between students and the landscape
4. Discovery using their senses

In turn, data collected will be recorded on the Konza Ed website.

### **Outline**

- Students will use prior knowledge
- Through the internet students will be introduced to the Konza Prairie Biological Station
- Students will be exposed to the usefulness of Konza Ed databases
- Driving question – Should we save native prairies? If so, how should we go about preserving native prairies?
- Students will be prepped on how to collect data
- Students will participate in field study
- Students will process data and record results on Konza Ed and local databases
- Students will prepare a brochure for final project

### **Standards**

Standard 1- Science as Inquiry- As a result of activities, all students will develop the abilities to do scientific inquiry, be able to demonstrate how scientific inquiry is applied, and develop understandings about scientific inquiry.

- Benchmark 1: The students will demonstrate abilities necessary to do the process of scientific inquiry.
  - 1. The student will identify questions that can be answered through scientific investigations.
  - 2. The student will conduct a scientific investigation.\*
  - 3. Use appropriate tools, mathematics, technology, and techniques to gather, analyze and interpret data\*
  - 4. Think critically to identify the relationship between evidence and logical conclusions
  - 6. Communicate scientific procedures and explanations\*
- Benchmark 2: The students will apply different kinds of investigations to different kinds of questions.
  - 1. The student will differentiate between a qualitative and quantitative investigation
  - 2. The student will adapt an existing lab or activity to write a different question, identify another variable, and/or adapt the procedure to guide a new investigation.

- Benchmark 3: The students will analyze how science advances through new ideas, scientific investigations, skepticism, and examining evidence of varied explanations.
  - 1. After doing an investigation, students will generate alternative methods of investigations and/or further questions for study.
  - 3. Students will identify faulty reasoning or conclusions that go beyond evidence and/or are not supported by data.

Standard 3: Life Science- As a result of activities, all students will apply process skills to explore and understand structure and function in living systems, reproduction and heredity, regulation and behavior, populations and ecosystems, and diversity and adaptations of organisms.

- Benchmark 3: The students will describe the effects of a changing external environment on the regulation/balance of internal conditions and processes of organisms. \*
  - 1. Understand the effects of change in environmental conditions on behavior of an organism by carrying out a full investigation.\*
- Benchmark 4: The students will identify and relate interactions of populations of organisms within an ecosystem
  - 1. Students will recognize that all populations living together and the physical factors with which they interact compose an ecosystem\*
  - 2. Classify organisms in a system by the function they serve (producers, consumers, decomposers.)
  - 4. Relate the limiting factors of biotic and abiotic resources with a species population, growth, decline, and survival. \*
- Benchmark 5: The students will observe the diversity of living things and relate their adaptations to their survival or extinction.
  - 2. The student will understand that adaptations of organisms- changes in structure, function, or behavior contribute to biological diversity

Standard 6: Science in Personal and Environmental Perspectives- As a result of activities, all students will apply process skills to explore and develop an understanding of issues of personal health, population, resources and environment, and natural hazards.

- Benchmark 2: The students will understand the impact of human activity on resources and environment.
  - 1. The students will investigate the effects of human activities on the environment.
- Benchmark 3: The students will understand that natural hazards are dynamic examples of earth processes which cause us to evaluate risks
  - 3. Communicate human activities that can cause/contribute to natural hazards.

Standard 7: History and Nature of Science- As a result of activities, all students will examine and develop an understanding of science as a historical human endeavor.

- Benchmark 1: The students will develop scientific habits of mind.
  - 4. Students will base decisions on evidence
- Benchmark 2: The students will research contributions to science throughout history
  - 1. Recognize that new knowledge leads to new questions and new discoveries.

\* Items marked with an asterisk, are particularly applicable to this activity.

### **Pre-study Activities**

1. Pre-assessment
2. Terminology
3. Plant and animal identification
  - Using field guide and internet resources
  - Using a dichotomous key
  - Students will construct plant and animal keys
4. Visit Konza Ed website
  - Scavenger Hunt activity
  - M & M activity (math dept)
  - Database and Query Activity (math dept)
5. Familiarize students with equipment used to collect data
  - Digital camera
  - Quadrat
  - Datasheets
  - Journaling (communications dept)
  - Plant press
  - Low-impact capture techniques
6. Environmental and Safety Activity
  - Preconception Quiz

### **Field Trip Logistics**

1. Date
2. Communication
  - Landowner
  - Cooperating teachers
  - Administrators
  - Transportation director
  - Parents
  - Volunteers or student assistants
  - Students
3. Examples
  - Parent/Student information forms
  - Volunteer/Student assistant forms
  - Student study field rules and expectations

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### **Field Study Activity**

1. Equipment needed
2. Data sheets
3. Instructions
  - Plant inventory
  - Plant collection
  - Digital photography
  - Journaling

### **Post Study**

1. Upload collected data to Konza Ed site
2. Download student photos
3. Process and mount collected plants
4. Create brochure with prairie photos
  - Technology class
5. Final assessment
  - Write final reflection

### **Future Expansion**

1. Biomass
2. Grasshopper count
3. Animal inventory
4. GPS use/mapping skills
  - Social studies