

Rolling Hills Wildlife Museum

R.H.I.N.O. Teachable Curriculum

This curriculum is based off the Kansas State Science Education Standards.

Science Standard:

3.4.1 3.4.2
3.4.3

Grade Level:

Fifth – Eighth Grades

Standards as a Unit Outcome:

Students will describe interactions that take place within an ecosystem, while tracing the flow of energy through the ecosystem's food web.

Cognitive Levels

(According to Benjamin Bloom's Taxonomy of Educational Objectives)

Knowledge Comprehension Analysis Synthesis

Components:

1. Students will define ecosystem.
2. Students will describe interactions within an ecosystem.
3. Students will develop a food web.

Notes to the Teacher:

The following teachable curriculum contains three components and one summative assessment. The first two components are designed as pre-visit activities. Please implement these in your classroom just days before your school field trip to Rolling Hills Wildlife Museum. The third component is designed as a self-guided activity for you and your class while on your field trip to the museum. The summative assessment is for you to use in measuring the retention of information by each student from this teachable curriculum. There is also an evaluation form following the summative assessment. Please complete this evaluation form and return to Rolling Hills Education Department in the self-addressed envelope included. We utilize evaluation forms to measure the success of our programs and not you or your class. Teachers submitting evaluation forms will be entered into a drawing for a free \$35.00 voucher towards your next education program scheduled with Rolling Hills.

Benjamin Bloom's Taxonomy of Education Objectives is the major educational theory utilized in the development of this teachable curriculum. Parts of other educational theories may also be evident to you. If you have any questions about this curriculum format, please contact Rolling Hills Education Department at (785) 827-9488, ext. 17. We are more than happy to assist you in any way we can.

R.H.I.N.O. Teachable Curriculum

Standards as a Unit Outcome: Students will describe interactions that take place within an ecosystem, while tracing the flow of energy through the ecosystem's food web.

Component:
Students will define ecosystem.

Criterion:
Students will identify the definition of ecosystem.

Formative Assessment:

Handout the "Environmental Definitions" worksheet to every student, and have them complete it in class by themselves.

Students must correctly identify the ecosystem definition. If they do not, have a peer assist them in developing an ecosystem definition from the words that were listed on the board. Then, have them try the worksheet again.

When scoring this worksheet, each correctly matched definition is worth one point except the ecosystem definition. It is worth five points, which makes the total possible points for the worksheet 10.

Presentation Methods:

Class Discussion
Individual Work

Activities:

The teacher will list the following words on the board: "Population," "Community," "Habitat," "Biotic," and "Abiotic." Students will need to raise their hands if they want to try and explain the definition for a word listed. After taking turns giving definitions, any words left undefined will need to be defined with a dictionary. If there are any unfamiliar words in the definitions of the above words, time must be taken to define those unfamiliar words as well.

Next, students will be asked if they have ever heard of the word "Ecosystem." They should also be given the chance to define it. The students will listen to the teacher explain that an ecosystem is a combination of all the words that were just defined.

Students will be given a short amount of time to develop a definition for ecosystem using the definitions of the words listed on the board.

Resources:

"Definitions Background Information"
"Environmental Definitions" worksheet

Extensions:

Enrichment: Have the students locate a definition for environment. Then, have them write one or two sentences that describes the difference between environment and ecosystem.

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Standards as a Unit Outcome: Students will describe interactions that take place within an ecosystem, while tracing the flow of energy through the ecosystem's food web.

Component:
Students will describe interactions within an ecosystem.

Criterion:
Students will write a narrative description of five interactions that take place in an ecosystem on school grounds.

Formative Assessment:

The students will now apply their knowledge of ecosystems and the interactions to school grounds. Each student needs a piece of paper, pencil, and clipboard (cardboard with a rubber band works well). Outside, students are to search the schoolyard ecosystem looking for animal interactions. Have students look in trees for birds, under rocks and in the grass for insects, next to fences for everything, etc. Remind the students that interactions are between two biotic things or between a biotic and abiotic part of the ecosystem.

Students are to describe five interactions in sentence form, with each one accounting for two points: one point for identifying a logical interaction and another for writing a complete sentence.

Presentation Methods:

Class Discussion

Cooperative Learning

Activities:

The students will be reminded of the definition for an ecosystem. The students will then be asked if grasslands, like what is in Kansas, can be a habitat and an ecosystem. Of course! It all depends on the context of the term's usage. The teacher will then write two sentences on the board (See "Ecosystem Discussion") and discuss them.

The teacher will pass out four pictures to small groups of students. In those groups, students will identify as many interactions as they can and share them with the class by finding a spot on the board to write them. If there is not enough space to write all the interactions at once, each group should write up the interactions for the same ecosystem then discuss any similarities and differences between the different groups' lists. Then move on to the next ones.

Resources:

"Ecosystem Discussion"

Four Ecosystem Pictures

Chalk Board and Supplies

Paper & Pencils

Clipboards (Cardboard works well)

Extensions:

Enrichment/Corrective – Have the students repeat the Formative Assessment as a homework assignment in their backyard. However, make them provide a description of their backyard ecosystem in addition to the original assessment.

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Standards as a Unit Outcome: Students will describe interactions that take place within an ecosystem, while tracing the flow of energy through the ecosystem's food web.

Component:
Students will develop a food web.

Criterion:
Students will develop a food web accurately predicting five food web connections.

Formative Assessment:

Students will need to develop a food web for one of the following two dioramas, the Aardvark/Warthog Diorama or the Southwest Butte Diorama (pronghorn and cougars). For each one, they need to identify as many animals as they can (refer to answer guide for the correct list), and draw lines for how they think the food web would be set up.

Five points should be awarded for identifying the animals in the diorama, and five points should be awarded for identifying five correct food web lines. Students may need to research the individual animals after they view them at the museum to identify what they might eat.

Presentation Methods:

Class Discussion

Activities:

Before the class's field trip, the teacher will explain to the class that a food chain is the flow of energy, food, through an ecosystem (ex. sun, grass, deer, wolves). As a class, discuss whether this food chain would be the only one in a grassland. Are deer the only animals that eat the grass? Are wolves the only animals that eat deer? Does anything eat wolves?

The teacher will now inform everyone that they are to bring a piece of paper, pencil and their clipboard to the Rolling Hills Wildlife Museum. During their field trip, they are going to see lots of ecosystems and animals interactions. See above for the activity.

Resources:

Paper and Pencils

Clipboards (Cardboard works well)

Food Web Answer Guide"

Extensions:

Corrective – Have the students develop a theoretical food web for the school grounds. What animals do they think use the school grounds for their ecosystem, spiders, centipedes, birds, rabbits, squirrels, etc.

Summative Assessment for Outcome:

Students will describe interactions that take place within an ecosystem, while tracing the flow of energy through the ecosystem's food web.

Assessment:

Ecosystem Worksheet

Administration Guidelines:

Each student should receive and complete their own "Ecosystem" worksheet. They need to pick five grassland animals and draw a picture in the space provided incorporating all five animals. The picture is not being graded for quality, just accuracy. You may remind students that an ecosystem includes an animal's habitat, which, in turn, includes all their survival needs. This up to the teacher's discretion. In the other box on the worksheet, they need to develop a food web for the five animals they identified. In the final box, they need to write three sentences that describe three interactions taking place in their picture.

Criteria for Assessment:

First and foremost, the students should be awarded one point for every animal (up to five) pictured that is truly a grassland animal. Also, the picture, since it is an ecosystem should depict food items (prey animals and plants), water source, shelter (keep in mind some grassland animals don't necessarily utilize shelter, like wolves, mule deer and lions), space (everyone will get this point) and air (again, everyone will get this point).

In the food web box, the students should be given three points for following the directions by using the same five animals identified in their picture and two points for incorporating all five without leaving any out. Second, students should be given one point, up to five points, for each logical food web connection made.

Next, three points should be awarded per sentence indicating an interaction taking place. One point is for identifying an interaction they depicted in their picture for each sentence. Another point should be based on logic for each sentence. Ask, would this interaction really take place? The third point should be awarded for each one if they are written in complete sentences.

The final one point, making this summative assessment worth 30 total points, should be awarded for turning the assignment in on time.

Extensions:

Enrichment – Using the food pyramid and knowledge of where food comes from, like meat from cows and chickens and cereal from plants, have students record what they eat over a short time period. Have the students transfer that data into a food web with them at the top. They can go one step further by adding their family members and/or pets into it as well. You know, all those table scraps the dog eats!

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Definitions Background Information

Teacher Instructions

The following definitions were taken from the sources listed below. Utilize these definitions in your class discussion.

Biotic: Any living thing

Abiotic: Any non-living thing

Population: A group of individuals of a single species inhabiting a specific area.

Community: An association of interacting species living in a particular area.

Habitat: A place composed of the resources required by an organism for its survival and reproduction; these requirements are species specific.

Ecosystem: A biological community plus all of the abiotic factors influencing that community.

Bolen, Eric G. and William Robinson. Wildlife Ecology & Management. Prentice Hall, Inc. 1999

Molles, Manuel C. Jr. Ecology: Concepts and Applications. WBC McGraw-Hill. 1999

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Ecosystem Discussion

Teacher Instructions

The key to understanding the difference between ecosystems and other environmental terminology, like habitat and community, is that it is a combination of both. An ecosystem is a habitat and all the living and non-living things that interact in the habitat.

With this understanding, one can see how habitat and ecosystem can be confusing, since a grassland can essentially be both. It all depends on the context the word is used in. Below are a list of sentences that show how this one word can be interpreted as both a habitat and ecosystem.

Habitat Sentences:

- A prairie dog digs a hole in the grassland for shelter.
 - This sentence is species specific, and talks about how the grassland meets a need of one particular animal.
- A lion prefers the tall golden grassland because it helps them hide.
 - This sentence is similar to the one above. It is species specific and it does not go on to mention any interaction.

Ecosystem Sentences:

- A ferret preys on prairie dogs in a grassland, and it uses its holes for shelter as do many grassland animals.
 - This sentence discusses the dynamics of a prairie dog town, and some of the interactions taking place there, which is located in the grassland ecosystem.
- Many birds follow an elephant as it stomps its way across the grassland kicking up lots of insects for the birds to eat.
 - This sentence discusses how other animals benefit from an interaction with the elephant in the grassland ecosystem.

Note: keep in mind that an ecosystem is just that, a system, and a system is a group of interacting elements.



Environmental Definitions



Fill in the blanks with the definition.

Biotic: _____

Abiotic: _____

Population: _____

Community: _____

Habitat: _____

Ecosystem: _____



Self-guided Curriculum Evaluation



Please complete the following form and return it to Rolling Hills Education Department, 625 N. Hedville Rd., Salina, KS 67401. This evaluation is very important for the future of this free program and the education programming as a whole. In addition, to show our appreciation for your time, you will be entered into a drawing for a free \$35.00 voucher good toward any future education program at Rolling Hills Wildlife Adventure during the 2005-2006 school year.

Teacher's Name: _____ Grade: _____

School: _____

Address: _____ City: _____ Zip Code: _____

We Visited: _____ Rolling Hills Zoo Only _____ Rolling Hills Wildlife Museum Only _____ Both

1. Did you schedule your field trip at least two weeks prior to your group's visit? _____ Yes _____ No
2. Did you receive your curriculum packet well enough in advance to help you prepare for your field trip? _____ Yes _____ No
3. Did you feel the format of the curriculum packet was confusing? _____ Yes _____ No
4. Was the curriculum packet a determining factor in making your decision to take your class field trip to Rolling Hills Wildlife Adventure? _____ Yes _____ No

Please Rate the Following

	<i>Disagree</i>			<i>Agree</i>	
	1	2	3	4	5
1. This curriculum packet was the major factor in our decision to visit Rolling Hills Wildlife Adventure					
2. The curriculum packet was helpful in preparing for our class field trip	1	2	3	4	5
3. Activities related to our classroom curriculum	1	2	3	4	5
4. Did your class enjoy the activities in the curriculum	1	2	3	4	5

1. What part of the curriculum did your students have most difficulty with if any? _____

2. What were the high, low and average scores your class received on the summative assessment for this curriculum packet? _____ High Score _____ Low Score _____ Average Score

3. Do you have any suggestions as to what themes or standards we should focus next year's spring fever curriculum around? _____

On the back of this paper, please include any suggestions you may have about making Spring Fever better and more user friendly.

!! THANK YOU !!