Contributors

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Intended Audience

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<td>K-4</td>
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<td>5-8</td>
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<td>9-12</td>
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Activity Characteristics

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<tbody>
<tr>
<td>Classroom Setting</td>
<td>X</td>
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<tr>
<td>Requires special equipment</td>
<td>X</td>
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<tr>
<td>Uses hands-on manipulatives</td>
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<tr>
<td>Requires mathematical skills</td>
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<tr>
<td>Can be performed individually</td>
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<tr>
<td>Requires group work</td>
<td>X</td>
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<tr>
<td>Requires more than one (45 min class) period</td>
<td>X</td>
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<tr>
<td>Appropriate for special needs student</td>
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Introduction

Description

Students will first complete research on an endangered animal and then create products to educate the rest of the class on the importance of saving their species.

Abstract

In this activity students get to choose an endangered animal that they would like to study. Students complete research on their animal including finding a scientific study that has been done on their endangered animal or a similar species. Students then create and give a presentation showing why their species is important, the greatest threats to their survival, and an idea for a new molecular study.

Core Themes Addressed

<table>
<thead>
<tr>
<th>Microbial Cell Biology</th>
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<tbody>
<tr>
<td>Microbial Genetics</td>
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<td>Microorganisms and Humans</td>
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<td>Microorganisms and the Environment</td>
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<td>Microbial Evolution and Diversity</td>
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<td>Other - Ecology</td>
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Keywords
Ecology, Species, Evolution, Endangered

Learning Objectives

At completion of this activity, learner will

1. Find, read and understand scientific research papers
2. Demonstrate basic knowledge of what an endangered species is.
3. Explain major impacts that affect endangered species.
4. Identify part of a species DNA sequence.
5. Demonstrate knowledge on how all organisms depend on each other.
6. Explain the difficulty in saving a species.

National Science Education Standards Addressed

Standard A: Science as Inquiry

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry
**Standard C: Life Science**

- Behavior of organisms
- Interdependence of organisms

**Standard E: Science and Technology**

- Understandings about science and technology

**Standard F: Science in personal and social perspective**

- Environmental quality
- Natural and human induced hazards
- Science and technology in local, national, and global challenges
Student Prior Knowledge

Students should have a background on biological concepts, ecology, and ecosystems. They will also need to understand the different categories in which endangered animals can be classified.

Teacher Background Information

This activity is a good end of the year project. It tries to tie together concepts from all areas of biology. Students may need help with finding a DNA sequence or deciphering a scientific study, teachers should be comfortable with this if they decide to leave the genetic section in.

Class Time

This activity will require a minimum of three 90 minute class periods

1. Students choose an endangered species (10 minutes)
2. Students fill out worksheet on their species (60 minutes)
3. Create PowerPoint, handouts, flyers, and bumper stickers (90 minutes)
4. Presentation day (90 minutes)

Teacher Preparation Time

This lesson will require approximately 15 minutes of preparation time.

1. Turn on computers (10 minutes)
2. Print handouts (5 minutes)

Materials and Equipment

1. Computers with internet access and PowerPoint
2. Construction paper or computer paper
3. Drawing materials

Methods

1. Students choose an endangered species
2. Students fill out worksheet on their species
3. Create PowerPoint, handouts, flyers, and bumper stickers
4. Presentations
Tips/Suggestions

1. It may be helpful to assign an endangered animal; this keeps students from fighting over the same animal and opens the student’s range of different species.
2. The genetics section can be removed or modified depending on teacher comfort and knowledge in that area.

References

This activity was modified from http://www.worldwildlife.org/

Extension/Additional Resources

A good list of endangered animals can be found at http://www.earthsendangered.com/list_html.asp
Introduction

You are an active member/promoter/marketing person for an international conservation group (World Wildlife Fund is an example). Your job is to inform the public about your organism and its ecosystem and get them to take part in helping conserve the area. The problem is that people are not knowledgeable of the area in any way and you have to help them understand how an ecosystem works in order to understand why there are conservation issues there and how they can help preserve the area. You will present your information as a PowerPoint, pamphlet, and bumper sticker.

Vocabulary

**Adaptation**: any alteration in the structure or function of an organism or any of its parts that results from natural selection and by which the organism becomes better fitted to survive and multiply in its environment.

**Common name**: the non-scientific name by which a species is known

**Deoxyribonucleic Acid (DNA)**: basic unit for genetic inheritance that consists of phosphates, deoxyribose, and 4 different nitrogenous bases (Adenine, Guanine, Cytosine, and Thymine). It has a double stranded structure that allows bases A-T and G-C to interact. The varying interaction ultimately results in gene expression.

**Ecosystem**: a system formed by the interaction of a community of organisms with their environment.

**Endangered**: a species that is threatened with extinction.

**Genetic Study**: a study based on the science of genes, heredity, and variation in living organisms

**Habitat**: the natural environment of an organism

**Organism**: a form of life composed of mutually interdependent parts that maintain various vital processes; (e.g. animal, plant, fungus).

**Preservation**: to keep alive or in existence; make lasting
Scientific name: the recognized Latin name given to an organism, consisting of a genus and species.

Species: the major subdivision of a genus, regarded as the basic category of biological classification. A species is composed of related individuals that resemble one another, and are able to breed among themselves.

**Materials Checklist**

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<table>
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<tbody>
<tr>
<td>Computer</td>
<td>with internet access</td>
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<tr>
<td>Crayons, Markers, or colored pencils</td>
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<tr>
<td>Construction paper or printer paper</td>
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**Procedure**

1. Complete the saving a species worksheet
2. Create a name for your conservation group
3. Present to the class your research and importance of your species by creating and presenting
   a. PowerPoint presentation
   b. Bumper sticker with catchy slogan
   c. Pamphlet of important information

Here are some suggestions to be included in your PowerPoint along with the information in your worksheet.

1. Location/Climate of the habitat.
2. Construct a food web (of at least 10 organisms)
3. Discuss other species in the area
   - Discuss why they are endangered-who or what is to blame?
   - Anything being done to help these “critters?”
   - What can we do to help?
4. Human impacts to the area/region
   - What can people do to preserve the area?
5. Pictures and/or video clips are recommended.
6. Be creative!!!!!
Student Worksheet

Saving a Species

Names:_____________________ Block:_______________

ECOLOGY

What is your species common name and scientific name?

Common Name:__________________
Scientific Name:__________________

Describe your species habitat (complete sentences)
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

How old can your species live to be? (complete sentence)
_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

What are 4 interesting facts about your species?
1)___________________________________________
2)___________________________________________
3)___________________________________________
4)___________________________________________
What is an adaptation? (complete sentence)

____________________________________________________________________________

____________________________________________________________________________

What food does your species eat? (complete sentence)

____________________________________________________________________________

____________________________________________________________________________

What are three adaptations of your species to find and eat this food?

1)________________________________

2)________________________________

3)________________________________

What are your species predators? (complete sentences)

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________

____________________________________________________________________________
What are three adaptations of your species to not get eaten?

1) __________________________________________

2) __________________________________________

3) __________________________________________

**EVOLUTION**

What is your species classification from Kingdom to Species?

- Kingdom: ______________
- Phylum: ______________
- Class: ____________
- Order: _____________
- Family: ____________
- Genus: _____________
- Species: ____________

**GENETICS**

Find a genetic study done on your species (www.googlescholar.com)

Title: ______________________________________________________________

Summary of abstract:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
Find part of your species DNA sequence.

google genbank, click genbank overview then go to search genbank (left side of screen) type in scientific name, search results for complete genome or partial sequence.

IMPACTS

What are some current threats to your species survival? Examples; habitat destruction, hunting, poaching etc. (complete sentences)

How does your species react to humans? (complete sentences)