**G:\GEAR UP 2012 to 2019\Graphics and Logos\AZ GEAR UP Logos\AZ_GEARUP_NAU.tiff**

**MIDDLE GRADE INITIATIVE**

**College and Career**

**C O N N E C T I O N S**

**E N D A N G E R E D S P E C I E S**

Northern Arizona University offers a variety of certificates and degrees that are founded in Natural Sciences and Forestry. This **C O N N E C T I O N** links Eighth Grade Social Studies Standards to studies in this critical field.

**AZCCRS addressed in this C O N N E C T I O N:**

**Social Studies, Strand 4, Geography**

Concept 5: Environment and Society

**Science Strand 3: Science in Personal and Social Perspectives**

Concept 1: Changes in Environments

**Northern Arizona University College of Engineering, Forestry, and Natural Sciences**

**From their website:**

<http://nau.edu/CEFNS/Degrees/>

“*Our forestry program is a gateway to a fulfilling career; it’s also an invitation to create sustainable solutions for the natural world and outdoor enjoyment for years to come.*

* *Ranked No. 10 in the nation among forestry programs in an index measuring faculty scholarly output*
* *Nationally accredited by the Society of American Foresters*
* *Listed in the Princeton Review’s Guide to 286 Green Colleges for demonstrating “an exemplary commitment to sustainability”*
* *National and international leader in natural resource education and forest research*
* *Five life zones within fifty miles of campus and six climate zones in the state*

*Here, your classroom will expand traditional confines to include the highest mountain range in Arizona, the Colorado Plateau and the world’s largest ponderosa pine forest—all conveniently located in and around Flagstaff.*

*You will also study with distinguished scientists who are recognized leaders in sustainability, and who will teach you their expertise.*

*If you’re up for the academic rigor and in-depth field research that precedes making a lasting environmental impact, then you’re at the right place.*

*This certificate in Wildlife Management is designed to provide students with knowledge and skills that will make them competitive for jobs with government agencies and other organizations involved in wildlife management. The certificate will be especially useful for students pursuing undergraduate degrees in biology, environmental science, or forestry. Wildlife management is grounded in an understanding of the biology of wild animals and ecosystem ecology.”*

**Degree Program:**

**Wildlife Ecology and Management, Undergraduate** **Certificate** (courses include :)

**ENV 326; ESSENTIAL ECOLOGY** - introduces ecological principles, including the distribution and abundance of organisms, population dynamics, community organization, energy flow, and nutrient cycling.

|  |
| --- |
|  |

**Lesson:**

**The third week of October is Wolf Awareness Week, dedicated to raising public awareness of the species, its importance and the threats to its existence. During that week, Social Studies or Science classes (or both) will take the last half of class periods to look at the problems of the species and other endangered/threatened species in Arizona.**

The Mexican Gray Wolf (El Lobo) was once the top predator in the southwestern United States and northern Mexico. Now its status is far diminished. What factors have influenced the decline of this animal? What efforts have been made to save it?

Students will read related curricular material, along with excerpts from the site for the Endangered Wolf Center in Missouri:

[http://www.endangeredwolfcenter.org/educational-resources/mexican-gray-wolf/#](http://www.endangeredwolfcenter.org/educational-resources/mexican-gray-wolf/).

The teacher will lead a brief class discussion to explore factors that have affected wolf populations and students will use the **attached study guide** to keep notes from their reading and the discussion.

At the end of the discussion, students will consider a list of other Arizona animals from the endangered species list (Apache Trout, Bald Eagle, Black-Footed Ferret, Black-Tailed Prairie Dog, Burrowing Owl, California Condor, Chiricahua Leopard Frog) from the Arizona Fish and Game Department and choose an animal to investigate. Students may work independently or share information with classmates studying the same animal. They will use the study guide **(attached)** to organize their investigations.

When investigations are complete, students will be grouped with classmates who researched different animals. Using T-Charts or Venn diagrams, they will compare species and determine if there are similarities in the situations that lead to endangerment or steps necessary for preservation. Students will rotate periodically to discuss with different groups. The class will be drawn back together and the teacher will facilitate a discussion, exploring questions derived from the standards about human impact on ecological systems. At the end of the class, each student will write a one paragraph reflection addressing their impression of the problems of endangered animals and the extent of human responsibility to preserve the environment.

**Deliverables and Assessment**

Standards by assignment

**Wolf Study Guide –**

Social Studies Strand 4, Geography

PO 1. – How Humans modify ecosystems

PO 2. – Why humans modify ecosystems

PO 3. – How changes in environment affect human activities

PO 4. – Best Uses of Natural Resources

Science Strand 3: Science in Personal and Social Perspectives

Concept 1: Changes in Environments

**Endangered Species Study Guide**

As above:

Social Studies Strand 4, Geography

Science Strand 3: Science in Personal and Social Perspectives

**Facilitated Class Discussion**

As above:

Social Studies Strand 4, Geography

Science Strand 3: Science in Personal and Social Perspectives

**Reflection**

As above:

Social Studies Strand 4, Geography

Science Strand 3: Science in Personal and Social Perspectives

**From the Arizona Department of Education Website:**

**AZCCRS for Social Studies and Science, Grade 8**

Social Studies, Strand 4, Geography

Concept 5: Environment and Society

PO 1. Describe how (e.g., deforestation, desertification) humans modify ecosystems.

PO 2. Describe why (e.g., resources, economic livelihood) humans modify ecosystems.

PO 3. Explain how changes in the natural environment can increase or diminish its capacity to support human activities.

PO 5. Analyze changing ideas and viewpoints on the best use of natural resources (e.g., value of oil, water use, forest management).

Science Strand 3: Science in Personal and Social Perspectives

Concept 1: Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

PO 1. Analyze the risk factors associated with natural, human induced, and/or biological hazards, including: • waste disposal of industrial chemicals • greenhouse gases

PO 2. Analyze possible solutions to address the environmental risks associated with chemicals and biological Systems

**ENDANGERED SPECIES STUDY GUIDE**

SPECIES\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Consider the following questions as you conduct your investigation. As you discover more, you will find that you need to add additional questions, to tell the story. Please add those questions as you go along. When you find an answer, please be sure to cite the source of your information.

How long has this species been in danger?

What caused its problems?

What was the human impact?

When did rescue attempts begin?

What has been done to save this species?

How successful have those efforts been?

What is the situation now?

What would be the impact of losing this species, on the environment and on humans?

If the species is to be preserved, what new steps must be taken?

**G:\GEAR UP 2012 to 2019\Graphics and Logos\AZ GEAR UP Logos\AZ_GEARUP_NAU.tiff**

**MIDDLE GRADE INITIATIVE**

**College and Career**

**C O N N E C T I O N S**

**Feedback**

**E N D A N G E R E D S P E C I E S**

Thank you for taking a moment to share your feedback regarding the **College and Career** **CONNECTION, Endangered Species**. We appreciate your time! Please send the completed form to Dawne.Spangler@nau.edu

Participant: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

District: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What grade(s) and subject(s) do you teach? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Please share your thoughts: Was this **CONNECTION**

**Relevant**? Yes Somewhat No

Comments

**Interesting to students**? Yes Somewhat No

Comments

**Practical**? Yes Somewhat No

Comments

What suggestions do you have to improve this **CONNECTION**?

What requests or suggestions do you have for new **CONNECTIONS**?