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Yellowstone 2012

Lesson Plan: Wolves of Yellowstone

**Lesson Plan Outline**

1. *Lesson Description*:

This lesson centers on the controversy regarding the reintroduction of the wolf to Yellowstone National Park. It includes a video addressing the role of keystone predators in the ecosystem, a very brief PowerPoint introduction to the wolves in Yellowstone, and an opportunity for students to develop a Public Service Announcement regarding the controversy. Its intended audience is Advanced Placement Environmental Science classes but may be adapted to other levels or classes.

2. *Introduction*:

The lesson introduces the idea that public lands often expand past their borders and can influence surrounding ecosystems and economies. It allows the student to create a Public Service Announcement regarding the wolf reintroduction by “time traveling” to a particular decade when Yellowstone wolves were absent from the park to inform & sway the citizens to a particular point of view regarding the controversy.

3. *Content Standards* – all standards refer to College Board’s standards for AP Environmental Science:

II. The Living World

A. Ecosystem Structure - (Biological populations and communities; ecological

niches; interactions among species; keystone species; species diversity and edge effects; major terrestrial and aquatic biomes)

C. Ecosystem Diversity - (Biodiversity; natural selection; evolution; ecosystem

services)

III. Population

A. Population Biology Concepts - (Population ecology; carrying capacity;

reproductive strategies; survivorship)

IV. Land and Water Use

A. Agriculture

1. Feeding a growing population - (Human nutritional requirements; types

of agriculture; Green Revolution; genetic engineering and

crop production; deforestation; irrigation; sustainable

agriculture)

C. Rangelands - (Overgrazing; deforestation; desertification; rangeland

management; federal rangelands)

D. Other Land Use

3. Public and federal lands - (Management; wilderness areas; national parks;

wildlife refuges; forests; wetlands)

5. Sustainable land-use strategies

VII. Global Change

C. Loss of Biodiversity

1. Habitat loss; overuse; pollution; introduced species; endangered and

extinct species

2. Maintenance through conservation

3. Relevant laws and treaties

4. *Objectives*:

1. The student will consider the history of the wolf in the Greater Yellowstone Ecosystem.

2. The student will investigate the role of keystone predators in ecosystems.

3. The student will examine the controversy regarding the reintroduction of the wolf to

Yellowstone National Park.

4. The student will evaluate the proper course of action regarding the reintroduction of the

wolf.

5. *Time Required*:

*Day One*:

Activity 1: (45 minute) – Students will watch *America the Wild: Inside the Wolf Pack* and will answer the accompanying questions (the questions may be found in Appendix 1). The website for the video is: <http://channel.nationalgeographic.com/wild/videos/inside-the-wolf-pack/>

*Day Two:*

Activity 1: (10 – 15 minutes) – The very short PowerPoint *Wolves of Yellowstone National Park* will be presented. The purpose of the PowerPoint is simply to give the students a brief introduction to basic facts about wolves. It is intentionally short to avoid swaying students’ opinions in favor of or against the wolf reintroduction.

Activity 2: (3 class days + additional time outside of class) – Students will complete the “When

Was Now? When was Then?” Activity (found in Appendix 2).

6. Materials:

Video - *America the Wild: Inside the Wolf Pack -* <http://channel.nationalgeographic.com/wild/videos/inside-the-wolf-pack/>

*Wolves of Yellowstone National Park* PowerPoint

Computers with PhotoStory, MovieMaker, or iMovie

7. Assessment:

The rubric found in Appendix 3 will be used to assess the Public Service Announcements.

8. Extensions:

Students may create their own PowerPoint to be used with introductory biology classes regarding the importance of keystone predators in various ecosystems across the globe.

Students will create a timeline of the loss of keystone predators in North America.

9. Interdisciplinary Features:

Language Arts – Students will develop research skills as they peruse the peer-reviewed journals for supporting information. They will also utilize their persuasive writing skills in the development of their PSA.

Technology – Students will develop their technology skills by the use of PhotoStory, MovieMaker, or iMovie in the development of their PSA.

Social Studies – Students will investigate the influence of science and society on economic sectors. They will also explore worldviews in the decision-making process.

*Appendix 1:*

*America the Wild: Inside the Wolf Pack* - Video Questions

1. Which wolf pack is Casey Anderson tracking?

2. In what season do wolves mate in Yellowstone National Park?

3. When was Yellowstone’s last wolf killed in the early era?

4. In what year were the wolves reintroduced to Yellowstone National Park?

5. How many layers of hair do wolves have?

6. How far can wolves travel in one day?

7. How many wolf attacks on prey are typically successful?

8. How many wolves are in the Gibbon Pack in this video?

9. How much meat can a wolf consume in one meal?

10. How have bears benefitted from the reintroduction of wolves to the park?

11. How many wolves are predicted to be outside of the park’s boundaries in the Greater Yellowstone Ecosystem?

12. How many sheep were lost from the ranch due to suspected wolf attacks?

13. Which animal has benefitted by a reduction in the coyote population due to the wolf reintroduction?

14. How do wolves help riparian areas?

15. What large rodent’s population increased due to the wolf reintroduction?

16. How do they identify the Mexican wolf pups?

ANSWERS:

1. Silver

2. Winter

3. 1926

4. 1995

5. 2

6. 120 miles

7. 1 in 5

8. 17

9. 20 pounds

10. More meat availability

11. 1500

12. 400

13. Pronghorn

14. They keep the elk from congregating near the water & this allows the willows to grow.

15. Beaver

16. Microchips

*Appendix 2:*

“When was Now? When was Then?”

~ *Bill Nye*

You and your fellow APES have the perfect opportunity to reshape the past. You have just found a working Time Machine on e-Bay & have decided to venture to the past to share with the citizens of Montana, Wyoming, Idaho and the rest of the United States your newfound information on the wolf reintroduction. The last wolf was killed in Yellowstone National Park in 1926. Wolves were reintroduced in 1995. For almost 70 years, wolves were essentially absent from the Greater Yellowstone Ecosystem. You may pick any decade from the 1920s to 1980s to visit. For your visit, you will create a Public Service Announcement (PSA) to educate and persuade the citizens to side with your opinion regarding the wolf reintroduction. You may be either in favor of ***or*** against the reintroduction – you must support your opinion with data, however. Your PSA should be from 8-10 minutes. You may use PhotoStory, MovieMaker, or iMovie to create your PSA. Since you’re doing a period piece, your language, clothing, and behavior should be appropriate for that decade. Below, you will find the specific requirements for your PSA. Be creative & have fun!

PSA Requirements:

1) ***Brief background of the issue*** – Give a brief history of wolves in the park.

2) ***Major stakeholders*** – Who/what was affected by the eradication of the wolves? Who/what was affected by their reintroduction?

3) ***Economic effects*** – For this section, you should include an economic comparison of both options. This comparison should include the effects that eradication of the wolf had on tourism, agriculture, land management, etc. Then, you should also include the effects that reintroduction had on these same economic sectors.

4) ***Ecosystem structure*** – Describe how your opinion will affect the overall health of the GYE. Be sure to include not only direct effects but also any indirect influences the wolf eradication/reintroduction provides.

5) ***Ethical considerations*** – Describe how your opinion espouses one of the major environmental worldviews. Discuss whether there is a moral/ethical obligation to follow your opinion.

Your PSA should cite a minimum of 8 peer-reviewed journal articles in its presentation. Use these journals to provide supporting data and evidence for your argument. You may use EBSCO Host to find these journals. These journals must be cited in the credits of your PSA.

*Appendix 3: Public Service Announcement Rubric*

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| **Effectiveness** | Project includes all material needed to gain a comfortable understanding of the topic. It is a highly effective PSA. | Project includes most material needed to gain a comfortable understanding of the material but is lacking one or two key elements. It is an adequate PSA. | Project is missing more than two key elements. It would make an incomplete PSA. | Project is lacking several key elements and has inaccuracies that make it a poor PSA. |
| **Stakeholders** | All 5 stakeholders are accurately and thoroughly explained in the desired format. | All 5 stakeholders are accurately documented, but a few are not fully explained. | All 5 stakeholders are accurately documented, but many are not explained. | Fewer than 5 stakeholders are provided. |
| **Opinion/Resolution** | Resolution is very organized with well-constructed explanations supported by facts. Resolution provides a clear, plausible solution to the issue. | Resolution is organized with well-constructed explanations and is clear. | Resolution is organized but not plausible. | The resolution appears to be disorganized or is not supported by facts/data. |
| **Research/Statistical Data** | Students include 8 or more peer-reviewed journals to support their PSA. | Students include at least 6 peer-reviewed journals to support their PSA. | Students include at least 4 peer-reviewed journals to support their PSA. | Students include fewer than 2 peer-reviewed journals to support their PSA. |
| **Originality** | Presentation shows considerable originality and inventiveness. The content and ideas are presented in a unique and interesting way. | Presentation shows some originality and inventiveness. The content and ideas are presented in an interesting way. | Presentation shows an attempt at originality and inventiveness on 1-2 cards. | Presentation is a rehash of other people\'s ideas and/or graphics and shows very little attempt at original thought. |