Impact of Our Energy Use on Wildlife, Their Habitat, and the Ecosystem

Summary: In this lesson students will learn about the impact that our energy use has on wildlife, habitat, and ecosystems. It is imperative that as energy consumers all of us have a deep understanding about energy choices and costs of those choices to the environment.

Language Arts Connection:

Students are given the opportunity to discuss what they have learned in this lesson, within a collaborative classroom setting. In this way, students will be able to formulate ways in which they can help the environment by smart and informed energy choices. This activity is an opportunity to develop ideas, and engage critical thinking skills as they discuss the impact of their personal energy usage on wildlife.

Educational Standards

4TH GRADE

- **Science 4.ESS3.1:** Students who demonstrate understanding can obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.
- **ELA 4.3.W.3:** Students will express an opinion and provide fact-based reasons as support.
- **ELA 4.7.W.1:** Students will create multimodal content that effectively communicates an idea using technology or appropriate media.
- **ELA 4.1.R.1:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

5TH GRADE

- **Science 5.ESS3-1:** Students who demonstrate understanding can obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environments.
- **ELA 5.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

6TH GRADE

- **Science 6.MS-LS-2-1:** Students who demonstrate understanding can analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- **ELA 6.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

7TH GRADE

- **Science 7.MS-LS1-5:** Students who demonstrate understanding can construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.
- **ELA 7.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.
- **ELA 7.4.R.4:** Students will recognize the connotation and denotation of words.

8TH GRADE

- **Science 8.ESS3-1:** Students who demonstrate understanding can construct a scientific explanation based on evidence for how the uneven distribution of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- **ELA 8.1.R.3:** Students will engage in collaborative discussions about appropriate topics and texts, expressing their own ideas clearly while building on the ideas of others in pairs, diverse groups, and whole class settings.

Learning Objectives

Students will be able to identify and describe the relationship between our energy use and wildlife, their habitat, and the ecosystem.

TEACHER INFORMATION/BACKGROUND INFORMATION

This lesson is intended to build upon knowledge from the previous lesson, "Impact of Our Energy Use on Sustainability," providing more specific details about the impact of our energy use on wildlife, their habitat, and the ecosystem.

Vocabulary/Concepts

From previous lesson, "Impact of Our Energy Use on Sustainability"):
Sustainability: the ability to maintain our natural resources at a certain rate or level in order to keep ecological balance
Energy: the ability to do work, produce change, or move an object
Ecological Footprint: a measurement of how fast we consume resources and generate waste
Carbon Footprint: the amount of carbon dioxide & other carbon compounds emitted due to the use of fossil fuels by an individual, company, country, etc.
Climate Change: a change in the statistical distribution of weather patterns over an extended period of time
Mindful Consumption: intentionally thinking about the ecological footprint and/or carbon footprint of the products & services we consume in order to be more sustainable

New Vocabulary/Concepts for this lesson:
Ecology: the branch of science studying the interrelationships between organisms and environment
Habitat: the natural environment in which a particular organism lives
Ecosystem: an interdependent community made up living organisms and their environment, including the land, air, water, and minerals

Materials

1. Paper/pen (or tablet/computer) for journal entry prompt
2. Access to computer/tablet and projector
3. Videos:
    - **A Surprising Solution to Baboon Farm Raiding**, https://oeta.pbslearningmedia.org/resource/nat36-sci-baboon/a-surprising-solution-to-baboon-farm-raiding/
    - **Climate Change Contributes to Competition Between Red & Arctic Foxes**, https://oeta.pbslearningmedia.org/resource/nat36-sci-arcticfox/climate-change-contributes-to-competition-between-red-and-arctic-foxes/

- **Endangered Bears Overcrowding Remaining Habitat**, https://oeta.pbslearningmedia.org/resource/nat36-sci-bear/endangered-bears-overcrowding-remaining-habitat/
- **Guard Dogs Resolving Human and Wolf Conflict**, https://oeta.pbslearningmedia.org/resource/nat36-sci-dog/guard-dogs-resolving-human-and-wolf-conflict/
- **Human and Asiatic Lion Interactions in India**, https://oeta.pbslearningmedia.org/resource/nat16.sci.lisci.hlinteraction/human-and-asiatic-lion-interactions-in-india/
- **Orangutan Refugees**, https://oeta.pbslearningmedia.org/resource/nat15.sci.lisci.refugees/orangutans-refugees/
- **Urban Foxes: Exploring New Ecosystems** https://oeta.pbslearningmedia.org/resource/nat36-sci-urbanfox/urban-foxes-exploring-new-ecosystems/

4. World Map and Globe
5. Class Activity Handout Human Impact on Wildlife, their Habitat, and the Ecosystem. **OREEP Notebook page 161**.
6. Impact of Energy Use on Wildlife Powerpoint/Prezi/Google Slides Presentation (Here is one with the big picture & key concepts.) **PowerPoint Presentation**
7. Sustainable Coexistence Action Plan Handout **OREEP Notebook page 159-160**.

Engagement:

ESSENTIAL QUESTION: How does our energy use impact wildlife?

Misconceptions:

- Our energy use doesn't have detrimental impacts on wildlife, their habitat, and the ecosystem.
- Our energy use does have detrimental impacts on wildlife, their habitat, and the ecosystem, but that's okay, it will be fine.
- Our energy use does have detrimental impacts on wildlife, their habitat, and the ecosystem, but that's okay, we will create the technology needed to overcome these detrimental impacts.

CLASS SCHEDULE/ACTIVITIES BEGIN HERE

1. Journal Entry Prompt for Students: Knowing that the prefix ‘eco’ comes from the Greek oikos that can be translated as ‘environment/house,’ predict what you think the words ecology and ecosystem mean using both words and drawing. Then, describe what ecosystem/ecosystems you think you are a part of. Last, explain how you think our use of energy might impact ecosystems.

2. Ask students to share their entry with a partner and/or a small group. Then, have the partners and/or small groups work collaboratively to come up with a representation of how our energy use impacts ecosystems.

3. Have each pair and/or small group share their drawing with the class (either through drawing on a whiteboard or Smart Board in the classroom). Facilitate a discussion that points at accurate and inaccurate assumptions about our energy use on ecosystems.

Exploration

4. Students will split up into groups to watch one of the following videos:

- **A Surprising Solution to Baboon Farm Raiding**, https://oeta.pbslearningmedia.org/resource/nat36-sci-baboon/a-surprising-solution-to-baboon-farm-raiding/
- **Climate Change Contributes to Competition Between Red & Arctic Foxes**, https://oeta.pbslearningmedia.org/resource/nat36-sci-arcticfox/climate-change-contributes-to-competition-between-red-and-arctic-foxes/
- **Endangered Bears Overcrowding Remaining Habitat**, https://oeta.pbslearningmedia.org/resource/nat36-sci-bear/endangered-bears-overcrowding-remaining-habitat/
- **Guard Dogs Resolving Human and Wolf Conflict**, https://oeta.pbslearningmedia.org/resource/nat36-sci-dog/guard-dogs-resolving-human-and-wolf-conflict/
- **Human and Asiatic Lion Interactions in India**, https://oeta.pbslearningmedia.org/resource/nat16.sci.lisci.hlinteraction/human-and-asiatic-lion-interactions-in-india/
- **Orangutan Refugees**, https://oeta.pbslearningmedia.org/resource/nat15.sci.lisci.refugees/orangutans-refugees/
- **Urban Foxes: Exploring New Ecosystems** https://oeta.pbslearningmedia.org/resource/nat36-sci-urbanfox/urban-foxes-exploring-new-ecosystems/

Explanation

5. Discuss the handout, *Human Impact on Wildlife, their Habitat, and the Ecosystem*, as a class. **OREEP Notebook page 161**

6. Teacher will go over quick Powerpoint/Prezi/Google Slides Presentation that provides a quick overview of vocabulary/concepts that have been used in the lesson so far, but not yet specifically explained in detail. **PowerPoint Presentation**

Extension

7. Brainstorm on your own, then brainstorm with a partner or group the following questions:

- What do you think the human impact on wildlife, their habitat, and the ecosystem is in this area of Oklahoma?
- Now specifically, how do you think our energy use impacts wildlife, their habitat, and the ecosystem in this area of Oklahoma?
- How could we lessen our impact in order to more sustainably coexist?

8. Discuss the above questions as a class.

9. By yourself, fill out the Sustainable Coexistence Observation handout. **OREEP Notebook page 159-160**

Evaluation

- **Informal check-ins throughout the class:** the journal prompt and ensuing discussion; the discussion of the handout.
- **Formal check-in:** sustainable coexistence action plan.
- **Homework:** Have students research local wildlife, habitats, and ecosystems for an extended period of time, then present a sustainable coexistence action plan through a podcast, video, poster, presentation, etc.

Citations

PBS Learning Media, “A Surprising Solution to Baboon Farm Raiding.”

https://www.pbslearningmedia.org/resource/nat36-sci-baboon/a-surprising-solution-to-baboon-farm-raiding/?#.W0-VAdJKjIU

PBS Learning Media, “Climate Change Contributes to Competition Between Red & Arctic Foxes

https://oeta.pbslearningmedia.org/resource/nat36-sci-arcticfox/climate-change-contributes-to-competition-between-red-and-arctic-foxes/

PBS LEARNING MEDIA, “Endangered Bears Overcrowding Remaining Habitat.”

https://www.pbslearningmedia.org/resource/nat36-sci-bear/endangered-bears-overcrowding-remaining-habitat/#.W0-eENJKjIU

PBS Learning Media, “Guard Dogs Resolving Human & Wolf Conflict.”

https://www.pbslearningmedia.org/resource/nat36-sci-dog/guard-dogs-resolving-human-and-wolf-conflict/#.W0-fJdJKjIU

PBS Learning Media, “Human and Asiatic Lion Interactions in India.”

https://www.pbslearningmedia.org/resource/nat16.sci.lisci.hlinteraction/human-and-asiatic-lion-interactions-in-india/?#.W0-f7NJKjIU

PBS Learning Media, “Orangutan Refugees.”

https://www.pbslearningmedia.org/resource/nat15.sci.lisci.refugees/orangutans-refugees/?#.W0-iFNJKjIU

PBS Learning Media, “Urban Foxes: Exploring New Ecosystems.”

https://www.pbslearningmedia.org/resource/nat36-sci-urbanfox/urban-foxes-exploring-new-ecosystems/?#.W0-jddJKjIU