

Unit 4: Ecosystems and Human Impact
6th Grade Science
Class Meetings 21

Created July 2020

Essential Questions

- How does a system of living and nonliving things operate to meet the needs in an ecosystem?
- How do humans affect biodiversity?
- What effects do changes to physical and biological components have on an ecosystems population?
- How can a scientist predict patterns of interactions among organisms across multiple ecosystems?

Enduring Understandings with Unit Goals

EU 1: Explain how natural disasters occur.

- Examine how data can help guide weather scientist in making accurate predications
- Explain of natural phenomena can allow for reliable predications, while others occur suddenly.

EU 2: Describe how the use of natural resources impacts Earth.

- Explain humans use of fossil fuels and their effect on the environment.
- Examine fossil fuels and how they are formed and their locations.

EU 3: Examine global climate change.

- Compare and Contrast fossil fuel usage and climate changes.
- Explain global warming and how humans impact changes within their environments.

Standards

Common Core State Standards:

- **MS-LS2-1:** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- **MS-LS2-2:** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
- **MS-LS2-3:** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
- **MS-LS2-4:** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
- **MS-LS2-5:** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
- **RST.6-8.:** Cite specific textual evidence to support analysis of science and technical texts.
- **RST.6-8.9:** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- **6.NS.C.5:** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

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ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit Content Overview

1. Natural Disasters

- Outline a natural disaster of choice and how it develops.
- Define the process of how scientist identify and track natural disasters.
- Examine how technology helps identify natural disasters.

2. Fossil Fuels

- Show how fossil fuels are formed.
- Define how fossil fuels are consumed and used by humans.
- Examine the use of fossil fuels and their impacts on Earth.

3. Global Warming

- Explain the use of natural energy impacts Earth's climate.
- Analyze temperature change and assess its relationship to fossil fuels.
- Compare and contrast variances in climate, weather, and temperature over Earths history.

Interdisciplinary Connection:

- Language Arts - Writing
- Math– Computation/Word Problems
- Art – Illustration of systems and creating maps

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Daily Learning Objectives with *Do Now* Activities

Students will be able to...

- Analyze, interpret, and graph data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. ****
 - *Evaluate ecosystems using researched based data.*
 - *Examine population evidence in an ecosystem and generate data which explains the phenomena.*
 - *Outline and model key information which supports evidence of positive and negative impacts within an ecosystem.*
- Construct an explanation that predict patterns of interactions among organisms.****
 - *Formulate a series of data that demonstrates a trend.*
 - *Categorize data to identify organisms and patterns of interactions.*
 - *Compare and Contrast organisms and their place within the structure of an ecosystem.*
- Develop a model to describe the flow of matter and energy.****
 - *Construct a food web to demonstrate how matter and energy is transferred between producers, consumers, and decomposers.*
 - *Demonstrate how decomposers recycle nutrients from dead plant or animal matter.*
 - *Illustrate showing how atoms make up organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.*
- Construct an argument with evidence that changes in the ecosystem affect population. ***
 - *Examine how ecosystems and their characteristics can vary over time.*
 - *Construct a diagram showing how physical or biological components of an ecosystem can lead to shifts in all its populations.*
- Evaluate design solutions to maintain biodiversity.****
 - *Compare and contrast biodiversity in both terrestrial and oceanic ecosystems.*
 - *Outline how the biodiversity of an ecosystem can determine its health.*
 - *Analyze how changes in biodiversity can influence humans' resources*

Instructional Strategies/Differentiated Instruction

- Power Point Lecture with notetaking
- Guided notetaking
- Warm up activities
- Flexible grouping
- Independent reading
- Lab activities
- Exit slips
- Graphic Organizers
- Creating authentic connections for students
- Vocabulary word bank
- Rephrasing and restatement of information and concepts
- Tiered instruction
- Alternative test settings

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- Reading and accountable talk discussions of texts
- Student-led instruction
- Homework assignments
- Hands-on activities
- SIOP strategies- Teachers implement SIOP strategies to introduce academic vocabulary and use multiple modes of representation including gestural, oral, pictorial, graphic and textural.

Assessments

FORMATIVE ASSESSMENTS:

- Guided notes
- Homework
- Daily Think-Write-Pair-Share (TWPS) Activities
- Accountable Talk Discussions
- Oral questioning
- Exit slips
- Warm Up activities
- Close reading and interpretation of text
- Performance Task – Green Means, Let’s Go!
 - Future Rubrics Assessment in 2021-2022 school year

SUMMATIVE ASSESSMENTS:

- Quiz on EU 1
- Quiz on EU 2/ EU 3
- Performance Task – Green Means, Let’s Go!
- Unit 4 Test

Unit Task

Unit Task Name: Green Means, Let’s Go!***

Description: The students’ goal is to provide potential sustainability practices and solutions to their school leadership. Their challenge will be to make suggestions related to the physical building and/or redesign of the school's landscape. The students’ proposals will need to be based upon research and the research conducted within their school. Explain the environmental benefits for their decisions.

You are a member of the environmental club at your school. Your club has been asked by the principal to propose ways to make the school more sustainable. You will need to use your knowledge of environmental sustainability to make your school's environment "greener".

Evaluation: Summative Assessment and Future Rubric in 2021-2022 school year

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Unit Resources
<ul style="list-style-type: none">● Non-Fiction Text● Internet databases● Large format poster printer● Microsoft Power Point or Prezi● Laptops● NOAA website● Lab materials