06 UNIT 6-Global Change

Content Area: **Science**
Course(s): **Environmental Science**
Time Period: **Semester 1**
Length: **5 weeks**
Status: **Published**

Standards

	Analyzing and Interpreting Data
	Cause and Effect
	Asking Questions and Defining Problems
	Engaging in Argument from Evidence
	Constructing Explanations and Designing Solutions
	Systems and System Models
	Energy and Matter
LS2.A	Interdependent Relationships in Ecosystems
LS2.C	Ecosystem Dynamics, Functioning, and Resilience
HS-LS2-6	Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
LS4.C	Adaptation
LS4.D	Biodiversity and Humans
HS-ESS3	Earth and Human Activity
HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and climate change have influenced human activity.
HS-ESS3-3	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
HS-ESS3-6	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity (i.e., climate change).

Enduring Understandings

1. Human activities have physical, chemical, and biological consequences for the quality of our environment on a global level.
2. The ocean is an important sink in the carbon cycle although CO2 dissolved in seawater creates an acid which lowers its pH and may impact shell-forming organisms and coral.
3. Global trade and travel has accelerated the movement of exotic species which can affect biodiversity in the non-native habitat.
4. Conservation of biodiversity can occur at the species level or ecosystem level.

5. There is fossil evidence for 5 mass extinctions and some understanding on the natural causes for those events.

6. Humans are playing a role in the decline of biodiversity which many scientists believe is the 6th mass extinction.

Essential Questions

1. How does the ocean play a role in the carbon cycle?

2. What effect will ocean acidification have on the environment and global fisheries?

3. How do invasive species cause harm?

4. What role can policies play in the protection of species?

5. What are some ways humans are causing declining biodiversity?

6. Why do scientists believe we are in a 6th mass extinction?

Knowledge and Skills

Knowledge:

1. Students will learn about the interaction between the ocean and the atmosphere in the Carbon cycle.

2. Students will know about the effects of ocean acidification on plankton, shellfish and coral species.

3. Students will know the characteristics of a successful invasive species and how humans have accelerated their spread.

4. Students will know about invasive species found in NJ

5. Students will know about the decline in diversity for both wild and domestic species.

6. Students will know the patterns of declining in overall biodiversity and the consequences of the decline.

7. Students will know about policies enacted to protect species

8. Students will know about conservation policies to protect ecosystems.

9. Students will know about the causes of prior mass extinctions and the implication of current extinction rates.

Skills:

1. Design and interpret experiments.
2. Interpret diagrams such as the carbon cycle.
3. Construct and interpret graphs using data like population abundance.
4. Collect and analyze data in laboratory experiments.
5. Apply scientific reasoning to develop an argument based on evidence.

Modifications

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit?usp=sharing

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit?usp=sharing