

<b>Grade &amp; Course:</b> Zoology	<b>Topic:</b> Unit 6: Human Impact and Invasive Species	<b>Duration:</b> 3 Weeks
<b>Teachers:</b> Zoology PLC Teachers		
<p>SZ5a: Ask questions and define problems identifying the cause and effect of human activities on the biodiversity of organisms</p> <p>SZ5b: Design a solution to preserve species diversity in natural and captive environments with regard to conservation, habitat restoration, breeding programs, and management of genetic diversity at local and global levels.</p> <p>SZ5c: Construct an argument based on evidence of the short-term and long-term impacts of legal, societal, political, ethical, and economic decisions on animal diversity.</p>		
<b>Narrative / Background Information</b>		
<p><b>Prior Student Knowledge: (REFLECTION – PRIOR TO TEACHING THE UNIT)</b></p> <p>Students are expected to have background knowledge from their Biology class, including an understanding of basic cell structures, levels of organization, evolution, the geologic history of life, and basic taxonomy and classification.</p>		
<p><b>Year-Long Anchoring Phenomena: (LEARNING PROCESS)</b></p> <p>There is a wide variety of animal diversity across the planet.</p>		
<p><b>Unit Phenomena (LEARNING PROCESS)</b></p> <p><b>Phenomenon:</b> Humans transport invasive species that impact local species</p>		
<p><b>Inquiry Statement:</b></p> <p>How does human activity impact the biodiversity of life on Earth?</p>		
<p><b>Global Context:</b></p> <p>Globalization and Sustainability</p>		
<p><b>Key Concepts:</b></p> <p>Systems, Relationships, Communities, Communication, and Change.</p>		
<p><b>Related Concepts:</b></p> <p>Balance, Consequences, Patterns, Interactions, and Environment.</p>		
<p><b>Approaches to Learning Skills:</b></p> <p>Thinking Skills: Evaluate claims</p> <p>Communication: Presenting data, Active listening, and Media</p> <p>Self-management: Punctuality</p> <p>Research: Research, bias and credibility, Relevance, and Academic Integrity</p>		
<p><b>Science and Engineering Practices:</b></p> <p>Asking questions, constructing explanations, designing solutions, and engaging in argument from evidence.</p>		
<p><b>Disciplinary Core Ideas: (KNOWLEDGE &amp; SKILLS)</b></p> <p>Biodiversity ensures ecosystem resilience; disturbances (e.g., deforestation, pollution) can collapse ecosystems.</p> <p>Humans depend on biodiversity for ecosystem services; human actions can threaten biodiversity.</p> <p>Changes in land use, emissions, and resource exploitation impact organisms and ecosystems.</p>		

Conservation biology integrates habitat protection, captive breeding, and genetic management to maintain diversity.

Problem-solving must consider multiple constraints: ethical, social, and economic.

Human decisions have global and lasting environmental effects.

**Crosscutting Concepts: (KNOWLEDGE & SKILLS)**

Systems and Systems Model

Stability and Change

Cause and Effect

Patterns

**Possible Preconceptions/Misconceptions: (REFLECTION – PRIOR TO TEACHING THE UNIT)**

Invasive species movement is natural.

Invasive species increase diversity.

The cost of preventing and managing invasive species isn't worth it.

There is nothing we can do about invasive species.

Biodiversity is declining everywhere

The damage is done, and humans can't "fix" their impacts

Human impacts do not affect me personally

**Key Vocabulary: (KNOWLEDGE & SKILLS)**

Ecology, biotic, abiotic, ecosystem, habitat, niche, biogeochemical cycles, limiting factors, climate, biome, carrying capacity, biodiversity, extinction, invasive species, renewable resources, nonrenewable resources, sustainability

**Inquiry Questions:**

**Factual**

What is biodiversity, and why is it important?

List the major impacts humans have on the environment

What is an invasive species?

What is the difference between renewable and nonrenewable resources?

What is the primary cause of habitat destruction and loss of biodiversity?

What are the ethical decisions that impact species diversity?

What role do economic decisions play in animal diversity?

**Conceptual**

How do human activities, such as deforestation and pollution, impact the biodiversity of organisms in ecosystems?

What are the long-term consequences of human activities on the biodiversity of organisms, and how can we mitigate these effects?

Why is it important to maintain species diversity in both natural and captive environments?

How does genetic diversity management contribute to maintaining species diversity?

**Debatable**

Can we strike a balance between conservation efforts and human development to ensure the long-term survival of diverse species in both natural and captive environments?

Do legal decisions regarding habitat protection and conservation efforts impact animal diversity in both the short-term and long-term?

Summative assessment		
Assessment Tasks:  <b>Biodiversity and Conservation Project and Final Exam</b>		Relationship between summative assessment task(s) and statement of inquiry:  The tasks allow students to demonstrate their knowledge of the human impact and species diversity. Students will ask questions and then research/ gather information. They will create a written presentation of their research and orally present/argue with their peers.
Unit Objectives: - Teaching and learning is focused on effective teamwork and collaboration		
Inquiry & Obtain: (LEARNING PROCESS)	Evaluate: (LEARNING PROCESS)	Communicate: (LEARNING PROCESS)
<b>Week 1</b>  Introduction to Ecosystems and Human Impact	<ul style="list-style-type: none"> <li>- Students will read articles about human impact on the environment and invasive species. They will create research questions from these articles.</li> <li>- Using the questions, students will define problems that affect biodiversity.</li> <li>- Students will be assessed on their knowledge of human impact and biodiversity as they compile their research and get approval from the teacher.</li> </ul>	<ul style="list-style-type: none"> <li>- Students will peer-review their questions in groups and then present the best ones to the class for consideration.</li> </ul>
<b>Weeks 2 &amp; 3</b>  Research Paper/Project and discussions	<ul style="list-style-type: none"> <li>- Students will research how invasive species impact ecosystems.</li> <li>- They will then design a solution to limit the impacts of these organisms, focusing on one of the following factors: legal, societal, political, ethical, or economic</li> <li>- Students will discuss their findings in small groups</li> </ul>	<ul style="list-style-type: none"> <li>- Students will self-grade based on a rubric</li> <li>- Students will have checkpoints in their research where the teacher will provide constructive feedback</li> <li>- During small-group discussions, students will provide more directed feedback and ask questions to support further analysis.</li> </ul>

<p><b>Final Exams</b></p> <p>Dates vary for final exams</p>	<p>-Students will receive a study guide to prepare for the cumulative final exam.</p> <p>-Students will have class review done in class and available outside of class.</p>	<p>-Students will be summatively assessed on a final exam that is cumulative over the course year in Zoology. Students can be exempted from the final with a grade of 90 or above in the class.</p>
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**Resources (hyperlink to model lessons and/or resources):**

- Shape of Life website videos and activities
- Glencoe Science Biology book
- YouTube videos of Dissections of specific animals
- Eyewitness videos
- Preserved specimens slides for observation and dissection
- BBC nature documentaries
- Schoology school course

**Reflection: Considering the planning, process, and impact of the inquiry**

Prior to teaching the unit	During teaching	After teaching the unit