



GeoCivics Lesson Title: *Exploring Invasive Species through text evidence*

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Teacher: Myla S. Liljemark	Lesson title: Exploring Invasive Species through Text Evidence	Grade Level: 6-8
Notes: This is lesson one of two. This lesson can be taught before or after introducing the skill of paraphrasing and quoting text evidence.		
Pre-existing Knowledge: <ul style="list-style-type: none">• Students should know that plants and animals move on the earth. Some of this movement happens through natural migration, while other times it is influenced or caused by humans.• Students should have a basic understanding of what text evidence is and how to find text evidence in an article.		
Overview: <p>An invasive species is an organism that is not indigenous, or native to a particular area. Invasive species can cause great economic and environmental harm to the new area. -- (Nat Geo)</p> <p>The introduction of plants and animal species to new areas has happened throughout human history. With increased globalization however, the rate of non-native species introduction has increased. This has led to significant impacts on the environment and communities in particular regions.</p>		
Purpose: <i>What students will learn?</i> <p>Students will learn about how invasive species are introduced to a place, how they impact ecosystems, cities, and towns, and the efforts by people from these regions to control invasive species populations. Students will learn key vocabulary and how to choose strong text evidence to support answers to text-dependent questions. In the lesson, students will explore specific invasive plant and animal species in US Territories and Alaska, specifically, the North American opossum, green iguana, tamaligi tree, and brown tree snake, and they will explore their impact on the environment and people in those regions.</p>		

National & State Geography Standard(s):

National

NSS-G.K-12.5: Understand how human actions modify the physical environment.

Alaska State Geography Standards:

B) A student should be able to utilize, analyze, and explain information about the human and physical features of places and regions. A student who meets this standard should:

g) compare, contrast, and predict how places and regions change with time.

National & State Social Studies Standard(s):

National:

NCSS.3. PEOPLE, PLACES, and ENVIRONMENTS: This theme helps learners to develop their spatial views and perspectives of the world, to understand where people, places, and resources are located and why they are there, and to explore the relationship between human beings and the environment.

Alaska State Social Studies Standards:

B2) A student should understand historical themes through factual knowledge of time, places, ideas, institutions, cultures, people, and events. A student who meets the content standard should:

2) understand the people and the political, geographic, economic, cultural, social, and environmental events that have shaped the history of the state, the United States, and the world.

ELA Standards

Alaska ELA Standards

(Reading) Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

ISTE Teacher *and/or* Student Standard:

Student Standard: 1.3.a Effective Research Strategies - Students plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.

Language Function:

- Inquiry/Seeking Information: Students use language to observe and explore the environment, acquire information, inquire.
- Summarizing and Informing: Students use language to identify, report or describe information.
- Comparing and Contrasting: Students use language to describe similarities and differences in objects and ideas.
- Analyzing: Students use language to separate whole into parts, identify relationships and patterns.
- Inferring, Predicting, and Hypothesizing: Students use language to make inferences, predict implications, hypothesize.

Culturally Responsive Lesson Strategies:

- Social Justice - Lesson/Assignment provides avenues for students to connect learning to social, political, or environmental concerns that affect them and their lives - Students will consider the environmental concerns related to the introduction of invasive species to a region.

Objective(s):

- The student will identify the impacts of invasive species on the people and environment of a region.
- The student will identify the historical context of a contemporary geographic problem.
- The student will identify how humans impact the environment.
- The student will identify text evidence that supports analysis.
- The student will analyze text evidence to make inferences.
- The student will employ online research strategies to answer an inquiry question.

SIOP

SIOP Elements		
Preparation Adapting content Linking to background Linking to past learning Strategies used	Scaffolding Modeling Guided practice Independent practice Comprehensible input	Grouping Option Whole class Small groups Partners Independent
Integrating Processes Reading Writing Speaking Listening	Application Hands on Meaningful Linked to objectives Promotes engagement	Assessment Individual Group Written Oral

Evidence of Mastery (Measurable):

Formative - The students will work in small groups to answer the questions and provide text evidence for each of the articles about an invasive species: (Brown Tree Snake - Guam, Green Iguana - Puerto Rico, and Tamaligi Tree - American Samoa). Student groups will share their results with the class allowing for teacher assessment of the skill and learning.

Summative - Working individually, students will answer in writing, inquiry question #2: *Why are Grubby’s babies a threat to the ecosystem?*. Their response to the question must provide one piece of text evidence from the “Grubbies Babies” article to support their answer and must include a minimum of 100 words and be written in complete sentences. A score of 4+ points will indicate mastery.

Summative Assessment Rubric

Levels of Accomplishment	Criteria	Points
Meets Expectations	Student uses 100 or more words and complete sentences and accurately answers the inquiry question. The student’s inferences are supported	4 points

	strongly by text evidence from the text.	
Approaches Expectations	Student uses 100 words and mostly complete sentences to answer the inquiry question. Text evidence is provided but does not clearly or strongly support the student's inference.	3-2 points
Fails to Meet Expectations	Student uses less than 100 words and many incomplete sentences to answer the inquiry question. Text evidence is not provided.	1-0 points

Key vocabulary

- **invasive species** - An invasive species is an organism that is not indigenous, or native, to a particular area. Invasive species can cause great economic and environmental harm to the new area. -- Nat Geo
- **native species / indigenous species** - Plant or animal that lives in an area due to naturally occurring acts without any human involvement.
- **ecosystem** - a group of living organisms that interact within a specific environment
- **herbivore** - animals that feeds mostly on plants
- **carnivore** - animals that feed mostly on meat, or the flesh of other animals
- **urban** - belonging to, or relating to, a city or town
- **rural** - area with low population density; countryside

Materials

- Individual pictures of several species that live in your community, region, or state (NOTE: teachers will need to find and compile these pictures for their own location)
- National Geographic video: *Invasive Species 101* (3.31 min.) (see link in Sources)
- Handouts: Invasive Species Articles: "Green Iguana", "Tamaligi Tree", "Brown Tree Snake" - 1 copy for each group (found in Invasive Species Lesson Materials Document)
- Handouts: Evidence Sheets (Green Iguana/Tamaligi Tree/Brown Tree Snake) (found in Invasive Species Lesson Materials Document)
- Cut the texts for each into strips and put them into three labeled envelopes (Green Iguana, Tamaligi Tree, Brown Tree Snake).
- Handouts: Identify Text Evidence Question Sheet - 1 for each group (found in Invasive Species Lesson Materials Document)
- Handout: Green Iguana Evidence Sheet - Answer Key- 1 copy for the Green Iguana group (found in Invasive Species Lesson Materials Document)
- Handout: Tamaligi Tree Evidence Sheet - Answer Key- 1 copy for the Tamaligi Tree group (found in Invasive Species Lesson Materials Document)

- Handout: Brown Tree Snake Evidence Sheet - Answer Key- 1 copy for the Brown Tree Snake group (found in Invasive Species Lesson Materials Document)
- Handout: Articles: “Grubby Alaskan Adventure” and “Grubbies Babies” - 1 copy for each student (found in Invasive Species Lesson Materials Document)
- Student access to computers/technology to conduct research on their research question about invasive species in Alaska, the U.S. Territories or their local community.
- Student copies of Summative Assessment Rubric (in Evidence of Mastery section above)

Sources:

- Video: *Invasive Species 101/ National Geographic*: [“Invasive Species 101”](#)
- Wikipedia: [Map of Alaska](#) - This map is featured in the “Grubby’s Alaskan Adventure” text resource.
- Wikipedia: [Map of Puerto Rico](#) - This map is featured in the “Green Iguana - Puerto Rico” text resource.
- Wikimedia Commons: [-File:Guam on the globe \(Southeast Asia centered\) \(small islands magnified\).svg - Wikipedia](#) This map is featured in the “Brown Tree Snake - Guam” text resource.
- Wikipedia: [Map of American Samoa](#) - This map is featured in the “Tamalingi Tree - American Samoa” text resource.
- Wikipedia: [Opossum Range Map](#) - This map is featured in the “Grubby’s Alaskan Adventure” text resource.
- Alaska Zoo photos: www.alaskazoo.org: [Grubby and Grubby’s Babies Photos](#) - These “Photos are courtesy of John Gomes/Alaska Zoo” (These pictures are featured in the “Grubby’s Alaskan Adventure” and “Grubby’s Babies” text resources.)
- Wikipedia: [Iguana Range Map](#) - This map is featured in the “Green Iguana - Puerto Rico” text resource.
- Wikipedia: [Brown Tree Snake Range Map](#) - This map is featured in the “Brown Tree Snake - Guam” text resource.
- Wikipedia: [Brown Tree Snake Picture](#) - This image is featured in the “Brown Tree Snake - Guam” text resource.
- Wikipedia: [Tamaligi Tree Picture](#) - This image is featured in the “Tamalingi Tree - American Samoa” text resource.
- Wikipedia: [Fruit Bat Picture](#) - This image is featured in the “Tamalingi Tree - American Samoa” text resource.
- National Geographic Website: [National Geographic - invasive species definition](#)
- M. Liljemark: Image of Iguana taken by Myla Liljemark

- ChatGPT: Text resources were generated for the lesson using ChatGPT, an AI language model developed by OpenAI. (OpenAI, 2021). [ChatGPT](#)

Engage

Teacher Will:

NOTE: ELL and SPED students will be assisted with closed caption supports in the video shown. The Think, Pair, Share activity allows all students, including SPED, ELL and Gifted, to perform at their potential.

1. The teacher shows pictures of several species that live in their community, region, or state (every teacher must compile these pictures for their *own* location). Ask students if they are familiar with these species. Ask students if they think these species have always been in their current environment. Teacher prompts the students to think about the two questions below (less than one minute) and then discuss the two questions with a partner. (Think, Pair, Share)
 - a. *What is an invasive species?*
 - b. *What is a native or indigenous species?*
 - c. *Do you know any invasive species that we have here locally? If so, how do these species impact our local area?*
2. The teacher will then play National Geographic's video "[Invasive Species 101](#)" and engage the students in a discussion of the video.
3. Following their brief discussion of the video, the teacher will encourage students to share their definition of "invasive species" and "native or indigenous species" and identify any local invasive species.
4. The teacher will provide National Geographic's definition of invasive species: (Invasive species are non-native organisms that cause considerable damage when introduced to a new area.).

Student Will:

1. View pictures presented to the class by the teacher and then participate in a Think/Pair/Share, to answer the questions the teacher asks about invasive species. The students then share out their answers in a class discussion.
(Grouping: Partners/Whole class)
(Integrating Processes: Listening, Speaking)
(Preparation: Linking to background/prior learning)
2. Watch the video: National Geographic's video "[Invasive Species 101](#)" and engage in a class discussion of what they understand about invasive species from the video.
3. Following the discussion of the video, the students will share their definition of "invasive species" and identify any local invasive species. They will also develop their own definition for "native or indigenous species" and will identify examples in their local region.
4. Listen and make note of the definition of invasive species.

<p>5. The teacher will remind students that invasive species impact ecosystems as well as the lives of people that live there. The teacher will define “ecosystem”.</p> <p>6. Lead a short class discussion about how invasive species have impacted the local area including both the ecosystem and the lives of people that live there.</p>	<p>5. Listen and make note of the definition of “ecosystem”.</p> <p>6. Students will discuss how invasive species have impacted the local area including ecosystems and the lives of people that live there.</p> <p>(Grouping: Whole class) (Preparation: Linking to prior learning) (Integrated Processes: Listening /Speaking) Application: (Meaningful)</p>
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Explore

<p>Teacher Will: Inquiry question #1: <i>How can invasive species impact an ecosystem?</i></p> <ol style="list-style-type: none"> 1. Prep: The teacher will cut apart the text on the <u>Evidence Sheets</u> into strips as indicated (found in Lesson Materials Document) and will assemble them into <u>three labeled envelopes (Green Iguana, Tamaligi Tree, Brown Tree Snake)</u>, one for each of 3 groups. This will allow students to manually and collaboratively work with each piece of text evidence and physically manipulate them at their table as they work on that text in their group. 2. Introduce Inquiry Question #1 to the class and group students into three groups. Then pass out 1 copy of the <u>Identify Text Evidence Question Sheet</u>, a copy of an <u>Invasive Species Article handout</u> and the matching <u>labeled envelope with the Evidence Sheet strips</u> to each group and explain to the students that they will learn more about invasive species found in some of America's territories around the world, as they work together to 1) read and discuss the article and 2) answer the questions on the worksheet about an invasive species and 3) they are to provide text evidence from their envelopes to support their answer for each question. 	<p>Student Will:</p> <ol style="list-style-type: none"> 2. Reflect on Inquiry Question #1 and separate into groups to read and learn about an invasive species and its impact on ecosystems in one of America’s territories, and prepare with group members to complete the handouts provided by the teacher.
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3. Inform students that invasive species are all different. Some impact rural areas, and others impact urban areas. Define both words and explain the difference. Explain that what invasive animals eat can also determine their impact. Explain the difference between an herbivore and carnivore.

4. Have students work in their groups to read and answer questions about an invasive species found in one of the following US territories. **Groups:**

Green Iguanas: Puerto Rico

Tree Snake - Guam

Tamaligi Tree - American Samoa

5. The teacher will also explain to the students that they will work together in groups to determine text evidence that supports their answer to each question, and that each group will read one article for their assigned territory and respond to the following questions, and their answers should use the words: invasive species, ecosystem, urban or rural, and herbivore or carnivore.

NOTE: Each slip of evidence is labeled with a letter to make it easier for students to discuss and identify the strongest evidence. They will also prepare to share out their learning with the whole class.

Text Evidence Questions to be answered:

All groups answer these questions:

- *How does the invasive species impact urban and/or rural environments?*
- *What evidence from the text supports your answer?*

Questions to be answered for specific topics.

Students are to use the words herbivore or carnivore in their answers.

- *Green iguana: How does the green iguana's diet impact the ecosystem?*
- *What evidence from the text supports your answer?*
- *Brown tree snake: How does the brown tree snake's diet impact the ecosystem?*

3. Listen and make note of the definitions and information given by the teacher.

4. Students will work with their group members to read and discuss their article about an invasive species and read and respond to the questions on the Text Evidence Question handout and then manually sort through the slips of text evidence provided in the envelope. They will decide on text evidence that they all agree best supports their answers to the questions. Students must use the words invasive species, ecosystem, urban or rural, and herbivore or carnivore in their answers.

(Application: Promotes engagement)

(Grouping: Small group/Whole class)

(Integrating Processes: Listening/Speaking/Reading/Writing)

NOTE: The collaborative approach to this activity allows emerging readers to be assisted by their peers. It allows gifted students the opportunity to explain to others and justify their own opinion on the strength of evidence. ELL students are able to rely on stronger verbal skills.

- *What evidence from the text supports your answer?*
 - *Tamaliqi tree - How does the invasive tree impact herbivores in American Samoa?*
 - *What evidence from the text supports your answer?*
6. The teacher will explain to students that at the conclusion of the activity, they will all participate in a Jigsaw to share what they have learned about an invasive species in their particular U.S. territory.

Explain

Formative Assessment: The teacher will make note of each groups' share out of their learning and the text evidence they have identified as support for their answers.

Teacher Will:

1. The teacher will engage the class in a jigsaw share out by asking questions 1-5 from the Identify Text Evidence Question Sheet for each article, and by soliciting answers from the table group responsible for each invasive species. Deeper discussion can happen in order to clarify and come to an agreement as a class on what the best answer and/or evidence answers each question. The teacher will take notes on students' responses as a formative assessment.
2. Facilitate a class discussion about the content and text evidence in each of the three articles. The teacher will then ask the students to compare and contrast their findings relative to the impact these species have had on the 3 U.S. territories' ecosystems/environments.

Students Will:

1. Students from each group will share their answers to the questions asked by the teacher, identifying and explaining the text evidence that they think best supports their answer.
NOTE: All students, including gifted, SPED, and ELL, are able to verbally explain their thoughts which supports comprehension. Each group will share their identified text evidence for each answer. Students can also engage in a deeper whole-class analysis of text evidence when groups do not agree on the strongest text evidence for a question.
(Integrating Processes: Listening/Speaking/Reading) (Grouping/ Small group/Whole class) (Application/Meaningful/Promotes Engagement) (Assessment/Group/Oral)
2. Students participate in a class discussion comparing and contrasting the ways the 3 invasive species they have learned about have impacted the ecosystems/environments of the 3 U.S. territories they have read about.
(Grouping: Whole class) (Application: Meaningful /Linked to Objectives)

Elaborate:

Inquiry Question #2: *What similarities and differences do you notice between the opossum in Alaska and invasive species in the US Territories?*

Teacher Will:

1. The teacher will pass out copies and read out loud to the class the articles “Grubbies Alaskan Adventure & Grubbies Babies” (in Lesson Materials Document).
2. The teacher will guide students to think about what they have learned about invasive species and how the opossum in Alaska relates to what they have learned about invasive species in the US Territories of Puerto Rico, Guam, and American Samoa.
3. When done, the teacher will have the students share out what they learned in either a short written response or in small group discussions.

NOTE: This activity allows students the opportunity to compare/contrast and analyze. Students are thinking about and discussing the inquiry question. This Universal Design approach to guided reading allows students of all reading abilities to access the information. The inquiry question discussion activity following the reading allows students to process and analyze the prompt.

Students Will:

1. Students will listen to the teacher read aloud of the article and reflect on how what they heard about the opossum in Alaska relates to what they have learned about invasive species in the US Territories of Guam, American Samoa, and Puerto Rico.
2. Following the reading of “Grubby’s Babies,” the class will engage in a discussion about the similarities and differences between opossums in Alaska and the invasive species they learned about in the US Territories.
3. Students will write one quality research question that will take their learning further concerning invasive species in Alaska, the US Territories, or their local community. Students will then engage in online research using credible online sources to learn more about the topic and find the answers to their inquiry questions. Students will share what they learned in either a short written response or in small group discussion.

**(Grouping: Small groups or Independent)
(Integrating Processes: Listening/Speaking/
Writing)**

Evaluate

Teacher Will:

NOTE: Modification in length can be provided with fewer word requirements for ELL/SPED and more for gifted. More than one example of text evidence can be required for gifted students. Students were prepared to write this assessment by first discussing Inquiry Question #2 as a class, ensuring comprehension of the prompt and providing an opportunity for answer development.

Students Will:

Students could use speech-to-text software to support their emerging writing skills when needed.

1. After the small group discussion about Inquiry Question #2, the teacher will instruct students to answer in writing another inquiry question as a final assessment: ***“Why are Grubbies babies a threat to the ecosystem?”*** The teacher will show the Summative Assessment Rubric to the students and tell them that they must use one piece of text evidence from “Grubbies Babies” to support their answer. Their writing sample must be at least 100 words and their sentences must be complete.
2. The teacher will provide time for students to write their responses to the inquiry question and let students know that they can use the notes they have taken while hearing the teacher read the story of “Grubbies Alaskan Adventure & Grubbies Babies” during Elaborate to help them answer the question.
3. When completed, students will turn in their written answers to be assessed. A score of 4 or more will indicate mastery.

1. Review the Summative Assessment Rubric and reflect on the notes they had taken before about the Grubbies Babies article and prepare to write their response to Inquiry Question #2.

2. Working individually, students will answer the inquiry question: ***Why are Grubbies babies a threat to the ecosystem?*** in writing, with a minimum of 100 words, providing text evidence, and answering in complete sentences.

(Assessment: Individual/Written) (Application: Linked to Objectives) (Grouping: Independent)

Extension(s):

Students can explore local invasive species through research, outdoor lessons, and field trips. They can also look into the impacts of invasive species historically around the world. This lesson can be adapted for math and science classrooms with teachers extending learning by analyzing population growth trends of invasive species. It can also be paired with ELA course literature such as Doris Pilkington’s *Follow the Rabbit Proof Fence* placing invasive species in context with other social issues. This lesson could be included in larger units about ecosystems, biodiversity, colonization, and globalization.