



**Program Title:** Are Invasive Critters Truly Bad?

**Student “Teachers”:** Debbie Nalesnik and Graham Nash

**Invasive Species and Native Species**

**Age Group:** 4th Grade Students

**Invasive species focusing on:** PA

**Goals:** This lesson's goal is to educate the students on invasive as well as native species that are located in the state of Pennsylvania. Students will discover all species (native or invasive) have a role in our local ecosystem. Whether their role is viewed as detrimental or beneficial depends on multiple factors. In this activity students will investigate these factors and draw conclusions about each species and their ecological, economic and human health implications.

**Objectives:**

- Students will identify, explain and understand what invasive species are
  - Students will be able to use other terms for invasive species
- Students will identify which species are native and which are invasive in PA
- Students will discuss the benefits of invasive species
- Students will discuss the potential harmfulness of invasive species
- Students will see visually which ones are invasive, native, and what species are invasive
- Student will use their knowledge of what they have learned and implement it into the board game that has been created

**Audience Identification:**

- Sobel's Development Stage: The goal for the teacher is to engage the students on a deeper connection and understanding of nature. The teacher will be successful with that in this lesson plan as they are educating the students on the species that are native as well as invasive in their home state. The teacher in no means is degrading any of the species but rather educating the students that even the invasive species are not as bad as they are portrayed to be.
- Audience age: the children and young adults that would be participating in this lesson as well as activity would be from middle school to high school. Those ages range from 11-18.

- Number of students: As this can be shown online and in person it depends on the amount. However there is approximately 20-25 students in a class
- Affiliations: Students participating in CC spring virtual symposium 2022

### **Duration:**

Pre-Lesson: For preparation for this video and lesson there will be a week's preparation beforehand. We will start by creating a venn diagram which will be hands-on. Within this venn diagram we will need to have colorful paper for the diagram. One color will represent the detrimental, another color will represent the beneficial, and in the middle it will be for species that have beneficial and detrimental traits in the ecosystem. Next we will print out photos of invasive and native species

Day of Instruction - Prep: In order to make sure that we will be prepared for the class we will show up 10-15 minutes early with all of our materials and to set it up

Instruction: Total time: 5-8 minutes long. We will allow a minute long introduction before hand explaining who we are and what we are talking about for our lesson

Classroom Follow-Up: The follow-up in the classroom will be for the students to play the board game that we have created. This activity is just to allow the students to implement what they have just learned into a fun and engaging way

### **Location:**

The location may vary depending on the teacher. However, this lesson is pretty flexible and can be taught in various places. The teacher should pick an area where they will have access to a laptop to share the google slides.

### **Lesson Schedule:**

<u>Time</u>	<u>Location</u>	<u>Session</u>
9:10-9:20am	Class setting	Preparing for the class
9:30-9:32am	Class setting	Welcoming the class
9:32-9:40am	Class setting	Slides- Introduction of invasive species
9:40-9:48am	Class setting	Slides- Introduction of native species

9:48-10:15am	Class setting	Venn Diagram activity
10:15-10:25am	Class setting	Student discussion
10:25-10:40am	Class setting	Correct answer discussion
10:40-11:10am	Class setting	Introducing species in PA
11:10-11:30am	Class setting	Class discussion
11:30-1:00pm	Cafeteria	Lunch
1:00-1:20pm	Class setting	Slides- PA invasive species
1:20-1:25pm	Class setting	Class discussion- handout species
1:25-1:45pm	Class setting	Slides- PA native species
1:45-1:50pm	Class setting	Class discussion - handout images of species
1:50-2:10pm	Class setting	Slides- PA native species being invasive in other areas
2:10-2:15pm	Class setting	Class discussion
2:15-3:00pm	Class setting	Wrap up/follow up

### **Content:**

The lesson will be engaging the students with the environment around them. There will be numerous activities to allow the students to see what exactly the critter looks like. This will allow the student to use the information they learned in class and take it outside and educate others on what species is what and if it is invasive or native. The student will be able to connect with nature more after this. Below are the different species that will be taught and the key take away the student should learn.

Animal	Key Messages (Talk About in Leson)
Pumpkinseed Fish ( <i>Lepomis gibbosus</i> )	The Pumpkinseed Fish is native to Pennsylvania and The Great Lakes. They eat insects and mosquito larvae. Typically live in warm calm lakes (San Diego Zoo).
Walleye Fish ( <i>Sander vitreus</i> )	The Walleye fish is native to Pennsylvania and The Great Lakes. They are good predators and facilitate the migration of other species. They are also a popular fish for recreational fishing (AZ Animals, 2021).
North American River Otter ( <i>Lontra canadensis</i> )	They are a native species found in Pennsylvania. River Otters are predators so they are good at controlling the populations of food species that they prey on. The presence of them usually means that the ecosystem is healthy (Neef).
Round Eyed Goby ( <i>Neogobius melanostomus</i> )	The Round Eyed Goby is an invasive fish that is native to the Black and caspian seas in eastern Europe. They have reduced the populations of sport fish by eating their eggs and have been linked to outbreaks of botulism type-E in the Great Lakes. They are a good source of food for larger fish as well as birds (Ontario's Invading Species).
Zebra Mussel ( <i>Dreissena polymorpha</i> )	Zebra Mussels are native to the Caspian Sea in Asia. They harm native species because they out-compete other filter feeders which causes them to starve. They are good at filtering mass amounts of plankton from the water (King County).
Sea Lamprey ( <i>Petromyzon marinus</i> )	Sea lampreys are native to the Atlantic Ocean, Lake Ontario and the St. Lawrence River. They attach themselves to a host fish and end up killing them. Areas where there is a large population of them will see decreases in other

	species' populations (US Department of Commerce, 2016).
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**Methods:****9:10-9:20am:**

During this time the teacher will set up the classroom with all the activities and make sure that they have everything for the lesson

**9:30-9:32am:**

At this time the teacher will welcome their students into the classroom. The teacher's job at this moment is to make sure that the class is situated and that they are ready to learn about today's topic.

**9:32-9:40am:**

With the google slides that have been provided, introduce what an invasive species is. The teacher will use the slides to explain what makes an invasive species invasive. The teacher will also explain the roles the species has whether it is either beneficial or detrimental.

**9:40-9:48am:**

As stated before with the google slides that have been provided, introduce what a native species is. The teacher will use the slides as an aid to explain what is a native species and the roles that these species play in the ecosystem.

**9:48-10:15am:**

After the teacher is done introducing the topics that the students will be learning and the students have an idea of what an invasive and native species are, the teacher will allow the class to divide into four groups or less depending on the class size. After the students are divided into the groups the teacher will draw four venn diagrams. After drawing the venn diagrams on the board the teacher will give each student images of animals with their names. In those groups the students have five minutes to do research on the six species that they were given. Once the five minutes are up they will go up to their venn diagram and put the species where they think it belongs in. The venn diagram is broken up into three sections. The first section is beneficial to the ecosystem, the middle section will be for species that the students believe are known for being

detrimental to the ecosystem but also benefit the ecosystem also, and lastly the third section is for the species that are detrimental to the ecosystem.

**10:15-10:25am:**

After the students finish putting the species where they believe is correct, allow the students to disperse from their groups and talk amongst themselves about where they placed each species and why. This will allow the students to engage themselves into the activity and see the different perspectives of their classmates.

**10:25-10:40am:**

Allow the students to go back to their seats afterwards. When they are all seated and quiet, discuss the correct answers with them. Allow the students to explain to you why they thought they were correct. Make sure they know that it is okay that they are wrong.

**10:40-11:10am:**

After the activity and discussion is complete the teacher will proceed to hand out photos of species that are native and invasive to PA. Even though the images will have the names of the species the teacher should still introduce them with their names. These images will also be on the google slide.

**11:10-11:30am:**

After the teacher introduces the species the teacher should keep the students engaged and ask them questions that might get them thinking about their surroundings. Questions might be as the following:

- Have they seen these species before?
- Where have they seen these species before?
- What were they doing when they saw these species?
- How did these species stick out to them?
- Which species do they think is invasive and what species they think are native?

**11:30-1:00pm:**

This is when the students go to lunch

**1:00-1:20pm:**

Once the students are back in class and situated the teacher will resume the slides. This section is for the teachers to discuss PA invasive species. The teacher will discuss where each species came from, why they are invasive here, what role the species has in the ecosystem, and if they are truly detrimental or if they have beneficial attributes.

**1:20-1:25pm:**

At this time the teacher will step away from the google slide and take out the species that have been provided for the students to see them physically. The teacher will hand these out and ask students questions such as “what about these species stick out to them”?

**1:25-1:45pm:**

After discussing PA invasive species the teacher will resume teaching with the google slides and discuss native species in PA. The teacher will discuss where each species can be found in PA and the role that the native species plays in the ecosystem.

**1:45-1:50pm:**

At this time the teacher will step away from the google slide and bring out the species that they have (images). The teacher will hand these out and ask students questions such as what about these species stick out to them?

**1:50-2:10pm:**

After that discussion is complete the teacher will continue with the google slides. The teacher will discuss how native species in PA can be invasive in other areas. The teacher will also discuss the role that the species has in other areas where they are invasive. Discuss if the students think that the species are beneficial or detrimental.

**2:10-2:15pm:**

This discussion will pertain to the native species being invasive in other areas. The teacher can ask questions such as have the students seen these species outside of PA? Were those species they saw seem like they were hurting the ecosystem around them?

**2:15-3:00pm:**

Introducing our game heads up. Split the class up into three groups this time. Within these groups the teacher will hand out images that the students will have to hold over their heads as the other members of the groups will try to explain what it is. The images on the cards that are given to the groups will be images of the species they just learned or terms that were just taught as well. The purpose of this activity is to allow the students to reiterate what they have learned and use it into a fun activity. It is also good practice for the students to remember what they learned.

After the game is done and finished. The wrap up will start. This is a simple Q&A for the students. This will just be a quick refresh of what the students learned. The questions will be simple. The students will answer these questions on a separate sheet of paper. The questions can go along the lines of:

- Did you know that one of the numerous species we talked about was invasive?
  - If so, what was the species?
- Name one native species that caught your attention.

- Why did it catch your attention
- Have you seen any of these critters before?
  - If so, where did you see it?
  - What were your thoughts?
- What was the coolest thing you learned today?

After they finish that the students will be given their homework assignment. Their homework assignment will be to create a crossword puzzle with the materials they just learned. They will give their crossword puzzle to a classmate the next day to solve.

### **Management and Safety:**

The group will be talked to before the lesson begins about the expectations that we have for them as well as go over some rules: raise your hand to ask a question or speak, inform one of us before leaving the group for any reason, make sure to listen to us as well as follow up instructions. They will be told that if they are not able to follow these rules then they will have to sit out and not be able to participate in the lesson.

### **Equipment:**

List each item and quantity

#### **VENN DIAGRAM:**

- Three sheets of paper (different colors)
- Printed out photos of species
- Markers

Tape/staples

Or... a whiteboard/chalkboard

- Chalk
- Dry erase markers
- Erasers

#### **HEADS UP:**

- Cut out images of species (print as many as needed)
- Cut out images of terms (print as many as needed)
- Blank sheets of paper (depending on class size)
- Pens and pencils (in case student forgets)

### **Foul Weather Alternative:**



This lesson can be taught in outdoor and indoor spaces so if the weather causes the lesson to be taught unsafe then you can move to an indoor area.

**Evaluation:**

During the venn diagram activity the students should be engaging in conversation about what they have seen around there area and what they have not. They can also apply their prior knowledge (if they have any) to the discussion The students should be divided into groups and should all participating in the activity

During the heads up game make sure the students are staying on track. This activity is to reiterate what they have learned as this will be a fun and engaging activity for the students to remember.

The entire lesson should wrap up with around a 30 minute discussion about what they have learned. This will just be a quick refresh of what the students learned. The questions will be simple. The students will answer these questions on a separate sheet of paper. The questions can go along the lines of:

- Did you know that one of the numerous species we talked about was invasive?
  - If so, what was the species?
- Name one native species that caught your attention.
  - Why did it catch your attention
- Have you seen any of these critters before?
  - If so, where did you see it?
  - What were your thoughts?
- What was the coolest thing you learned today?

**Follow-up:**

After the lesson is completed, the students will be asked to create a crossword puzzle using the terms that they learned in the lesson. The students will complete this activity for homework and bring it to class the following day and exchange the puzzles with friends for them to complete.

**PA Standards:****Ecology**

**4.1.4A** - Explain how living things are dependent upon other living and nonliving things for survival.

**4.1.4.E** - Explain that ecosystems change over time due to natural and/ or human influences.

**4.1.4.F** - Science as Inquiry.

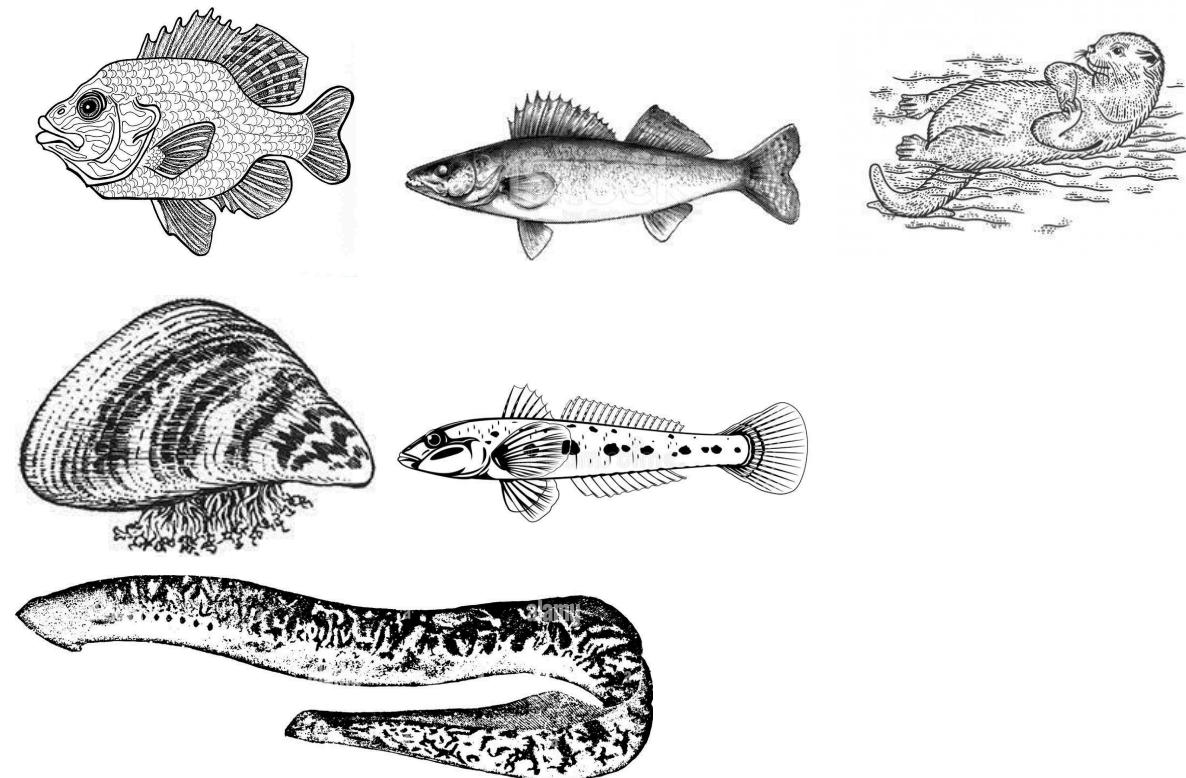
## Humans and the Environment

4.5.4.B - Determine the circumstances that cause humans to identify an organism as a pest.

### Google Slide:

<https://docs.google.com/presentation/d/1eHG5yBccMzXOc7MrTYeJRqwlbhgQ12ULNt7i1jyYi0/edit?usp=sharing>

### Images:



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