

Invasive Species: You're Not Welcome Here!

Guide your third through fifth grade students through interactive activities about invasive species



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By **Amy Paul**

LOOKS CAN BE DECEIVING! Invasive species look beautiful, unique, and harmless and to too many, they look great in a garden or fish tank. They shouldn't be fooled. Invasive species are non-native organisms that take over native habitats. They cause severe damaging effects to ecosystems of native plants and animals.

The following lesson plan will help third through fifth graders to distinguish between native versus invasive species. They will look at the impacts of invasive species on native ecosystems, and learn strategies to minimize those impacts. You can harness your students' enthusiasm to protect endangered species by discussing ways in which people can help endangered animals through the removal or prevention of invasive species. At the conclusion of the lesson, the students will make their own public service announcement video about invasive species and explain what people can do to address this global biodiversity issue – and share it with the school.

Invasive species are organisms that are not native to a certain area but have been introduced there and grow and/or reproduce rapidly.¹ They eradicate other native flora and fauna and take over ecosystems. Invasive species can be plants, terrestrial and aquatic animals, or microbes. Over

120 billion dollars in the United States and \$1.4 trillion globally each year are lost due to invasive species.²

Invasive species constitute the second greatest threat to biodiversity of species all over the world.³ Of the species listed as threatened or endangered under the Endangered Species Act in the United States, 42 per cent are considered to be at risk due to invasive species.⁴ In Australia, 54 per cent of the known causes of animal species extinctions were connected to invasive species, with 20 per cent solely involving invasive pests.⁵ In Canada, invasive species are the second leading cause of extinction and endangered status of freshwater fish, with 26 out of 41 species affected.⁶ These statistics illustrate how important it is for existing invasive species to be eradicated, and for measures to be taken to prevent the future introduction of more invasive species.

Invasive species can be introduced to non-native regions via many methods. Human activity is the primary cause of these introductions.⁷ Lumberyards, insect and plant hitchhiking, importing ornamental plants from different countries, and the exotic pet trade are all vectors for invasive species introductions. Aquatic invasive species are commonly introduced into new areas via boats and ballast tanks of large ships.

There are numerous approaches to manage these invasive species populations. One way is to eliminate invasive populations that have already been introduced. This involves killing

a certain population of invasive plants or animals. Another strategy is to control and monitor invasive populations and predict the invasion of non-native species. Prevention is the least ecologically taxing and most economically prudent.⁸

Educating children and young adults about invasive species allows them to learn about ecology, technology, and biology. In addition, it helps children comprehend the interdependence of organisms, and how a decrease or increase in the population of one species can affect an entire ecosystem. Educating youth on environmental topics such as invasive species can foster a future generation of environmental stewards.⁹ Read on for strategies to accomplish these goals in your classroom.

Lesson Plan

The following lesson plan is geared towards students in grades three to five, but can be adapted to older grade levels. Teachers can utilize all the activities if they are teaching a unit about invasive species. Yet, one or two activities can also be used if time is limited. This lesson plan would be equally useful for environmental clubs, nature centers, or after school programs, as the activities could easily be adapted.

Objectives/Outcomes:

Upon completion of this lesson a student will be able to:

1. Define an invasive species.
2. Explain how certain invasive species in North America are negatively affecting the ecosystem.
3. Elaborate on how invasive species affect ecosystems and native flora and fauna.
4. Explain how certain invasive species were introduced into North America.
5. Create a public service announcement about ways the public can help prevent, monitor, and/or control invasive species in their community.

Invasive Species Game (30 minutes)

(Adapted from Stepien, n.d.)¹⁰

PDFs available at greenteacher.com/invasive-species-youre-not-welcome-here/

Materials:

- 30 small squares (roughly 2"x2") of each of the following colors of laminated paper: blue, red, and yellow
- Timer
- Fish Species Chart (Grass Carp, Rainbow Trout, Kokanee Salmon, and Mountain Whitefish (Resource A - PDF))
- Fish Species Label Card (cut apart) (Resource B - PDF)
- Fighting to Survive handout (Resource C - PDF)

Location:

Outdoors ideally, but a large open room, gym or empty classroom can be used.

Directions:

- Ask students what they think invasive species are and write their guesses on a piece of poster board. Explain that they will be playing a game about invasive species.
- Three students will act as native species of fish. Each begin by choosing a different species of fish. The other

students will start as observers, but will join in gradually once the fish species reproduce.

- Show the fish species chart to the whole group and read the descriptions of each fish species. The goal is for each fish to collect at least eight pieces of food in 20 seconds (this number can be raised or lowered based on the abilities of your students).
- The three students can only eat certain colors of the paper squares as indicated on the chart and they can only move in ways mentioned on the cards.
- Tell the class each species of fish is native to North America except for the invasive Grass Carp (that will come into play in later rounds). This fish was originally from China but has found its way here.
- Spread out all the squares of paper throughout your designated playing area.
- The native species will begin by collecting as much food (squares of paper) as they can in 20 seconds. Those that do not have eight squares by the time the 20 seconds are up, will have to sit out the next round. (They didn't find enough food to survive.) At the end of each round, if a fish player has four extra squares (i.e. beyond the eight they need), they will get to pick someone sitting on the sidelines to become a member of their fish species. These extra players represent the offspring of the fish and join them in collecting squares of their color. If a fish species ever loses all their players, they are extinct and sit out of the game.
- After the second round, choose someone to represent the invasive species (Grass Carp). Whisper to that player that they should try to eliminate one species at a time by taking all of their food. Play four more rounds with the invasive species in the mix. Again, for every four extra paper squares each fish collects, they get to reproduce and have another person join their team.

Debrief:

- After the game have the students answer the questions on the Fighting to Survive handout in groups of four.
- Once they are done, have each group share their new definition of an invasive species. Discuss how their definitions changed as a result of playing the game.
- This activity should help students realize how invasive species can negatively affect an ecosystem.

Video Analysis (15 minutes)

Materials:

- Videos from the Internet:
 - YouTube Video: Little Things Big Problems: Invasive Plants in Our Parks¹¹ (6:45 minutes)
 - YouTube Video: Cosmo's World: Invasive Species¹² (6:37 minutes)
- Internet
- Camera with video ability, projector, and computer
- Chart Paper
- Marker

Directions for Video Analysis:

- Show the *Cosmo's World: Invasive Species* video and ask your students to take notes. This video covers the basic



information about invasive plants and insect species and how they reduce biodiversity. Then have them share with the class what an invasive species is, how they are spread, and why they can be detrimental to an ecosystem. Record the information on chart paper.

- Next show the video, *Little Things Big Problems: Invasive Species in our Parks*. This video depicts how invasive plant species damage native species, and explains how people can make a difference by removing invasive plants or preventing the spread of new invasive species. The students will share with the class different ways that invasive plants could be spread. The teacher will record the ways on a piece of chart paper.
- This activity will help students define an invasive species, explain how they negatively affect the flora and fauna of an ecosystem, and how they get introduced into North America.

Invasive Species Research (40 minutes)

Materials:

- Computers and or iPads
- Invasive Species Research handout (Resource D - PDF)

Directions:

- The students will work in groups of three or four to research an invasive plant or animal species from their state or province and complete the Invasive Species Research handout with information about that species. They also need to research how that species is impacting native species in the area.
- Once the students are finished, they will present their findings to the class.

Public Service Announcement

(Two sessions of 45 minutes)

Materials:

- Internet
- Projector/SmartBoard
- Computers (one per group of 4-5 students)
- Video camera or iPad
- Public service video announcement examples
 - Don't Move Firewood¹³ (56 seconds)
 - Interview with the Emerald Ash Borer¹⁴ (1:46 minutes)

Directions:

- Show the students some examples of public service announcements regarding invasive species to help them understand different approaches that public service announcements take to get their message across. A couple of examples are listed above.
- The students will work in their groups to make a public service announcement video to promote the news about a certain invasive species of their choice. The video needs to incorporate the following criteria:
 - Provide information about one particular invasive species in their home state or province.
 - Explain how that species was first brought there.
 - Explain ways that flora and/or fauna are negatively affected by this species.
 - Describe at least one way the public could help aid in the prevention or eradication of the invasive species.
 - Create an engaging video that catches peoples' attention.
 - The video should be between 30 seconds long and 2 minutes in length.
- To meet the above criteria, the students will need to research their species on the Internet. The Global Invasive Species Database¹⁵ allows students to find a list and information about invasive species in the United States. The Canadian Wildlife Federation's¹⁶ website offers a comprehensive information on terrestrial and aquatic invasive species in Canada. Australians will find the Pest Smart¹⁷ website to be a valuable resource for invasive species there.
- Once the videos are completed, they could be presented to the school and if allowed, they could be posted on the school website for public viewing.

Clean Up Your Community (45 minutes)

Materials:

- Hoes and/or shovels
- Garbage bags
- Work gloves (optional)

Directions:

- Have students go around their school property or community to identify an invasive plant species.
- The students will then research the proper removal procedure for that invasive species. Note: some plants can only be burned to prevent them from spreading, which is not recommended in a school setting.
- Following the research, students will remove the invasive

plants with hoes and shovels.

- This activity will help students put into place what they just learned and make a difference in their school community.

Extension:

- You can extend this activity by completing it on a Saturday and inviting the community to participate. This could lead to a quarterly or annual event and may even include activities or booths run by students to educate the community about the detrimental effects of invasive species and how people can make a difference. The extensions and opportunities to spread knowledge and awareness of invasive species are endless.


Amy Paul teaches 4th grade at CA Frost Environmental Science Academy in Grand Rapids, Michigan. She developed this unit as part of her graduate work with Project Dragonfly at Miami University in Oxford, Ohio, in conjunction with the Denver Zoo.

Notes

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