

Exotic Plant Fair Lesson Plan

Students learn about native, exotic, and invasive plants and their impacts on the environment.

Lesson Summary:

Students will investigate exotic plants in a science fair setting. In the process, they will gain an understanding of the problems created by exotic plants. They will create and deliver a persuasive message, and be exposed to the differing effects that mass media messages can have on a large number of people.

Grade Level: 3–8

Time Allotted: Four class periods of approximately 50 minutes each

Performance Objectives

References are to the Next Generation Sunshine State Standards (2007).

Language Arts

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| LA.n.1.7.2 | The student will identify the authors purpose (e.g., to inform, entertain, or explain) in text and how an author’s perspective influences text. (Grades 3-8) |
| LA.n.6.4.2 | The student will use digital tools (e.g., word processing, multimedia authoring, web tools, graphic organizers) to present and publish in a variety of media formats. (Grades 3-5) |
| LA.n.6.3.1 | The student will examine how ideas are presented in a variety of print and nonprint media and recognize differences between logical reasoning and propaganda. (Grades 4-5) |
| LA.5.6.3.2 | The student will use a variety of reliable media sources to gather information effectively and to transmit information to specific audiences. |
| LA.n.6.4.2 | The student will evaluate and apply digital tools (e.g., word processing, multimedia authoring, web tools, graphic organizers) for publications and presentations. (Grades 6-8) |
| LA.n.6.3.1 | The student will analyze ways that production elements (e.g., graphics, color, motion, sound, digital technology) affect communication across the media. (Grades 6-8) |
| LA.n.6.3.3 | The student will distinguish between propoganda and ethical reasoning strategies in print and nonprint media. (Grades 7-8) |

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Science

Grades 3-5

- Big Idea 1-A Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.
- Big Idea 15-A Earth is home to a great diversity of living things, but changes in the environment can affect their survival.
- Big Idea 16-A Offspring of plants and animals are similar to, but not exactly like, their parents or each other.
- Big Idea 17-A Plants and animals, including humans, interact with and depend upon each other and their environment to satisfy their basic needs.
- Big Idea 17-B Both human activities and natural events can have major impacts on the environment.

Grades 6-8

- Big Idea 1-A Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.
- Big Idea 15-A The scientific theory of evolution is the organizing principle of life science.
- Big Idea 15-C Natural Selection is a primary mechanism leading to change over time in organisms.
- SC.7.L.15.2 Explore the scientific theory of evolution by recognizing and explaining ways in which genetic variation and environmental factors contribute to evolution by natural selection and diversity of organisms.
- SC.7.L.15.3 Explore the scientific theory of evolution by relating how the inability of a species to adapt within a changing environment may contribute to the extinction of that species.
- Big Idea 16-B Genetic information is passed from generation to generation by DNA; DNA controls the traits of an organism.

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Big Idea 17-A Plants and animals, including humans, interact with and depend upon each other and their environment to satisfy their basic needs.

Big Idea 17-B Both human activities and natural events can have major impacts on the environment.

Prior Knowledge: None

Topic Overview

Exotic plants are those that have been brought to Florida by people. Some may have arrived with the first European explorers (e.g., water lettuce) and more arrive yearly. Exotic plants become invasive when the insects and other animals that eat them are not here, and they flourish. The plant may have toxins or other factors that are tolerated by species that eat them and keep them in check back home, but no Florida species are adapted to eat them. Plants are always competing for space, minerals, water, and sun. The invasives have an unfair advantage!

Invasive plants may produce a toxin that keeps other plants from growing around them, creating monocultures, like the punk tree or cajeput (*Melaleuca* sp.) in South Florida. The plants that should be there for a Florida habitat aren't there and the animals have no food. They die, move away, or don't raise any young.

There may be fungi or bacteria that keep the plant in check in its home range that are missing here.

Invasive aquatic species can cover the surface of the water and shade out the eelgrass that is food and shelter (substrate) for both fish and macroinvertebrates, or they can form dense growths that even fish can't get through. Fish can't find a place to lay eggs, and food supply is diminished. Waterways may become clogged so boats can't get through.

Many invasive plants were first introduced as landscape plants or grown for aquariums and released into streams and lakes. Invasive plants are often spread from place to place as hitchhikers on boat trailers.

Vocabulary

Aquatic plant

A plant that grows in water. Aquatic plants can be emergent (rooted in soil but sticking up above the water), submersed (with their roots, stems and leaves underwater), or floating (rooted in soil, with leaves and flowers that float on the surface).

Exotic plant

A plant that has been introduced to an area from outside its native range, either purposefully or accidentally.

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Invasive plant

A naturalized exotic plant that is expanding its range into natural areas and disrupting naturally occurring native plant communities.

Monoculture

An area that contains only a single species over a large area, resulting in a lack of biodiversity which is necessary for healthy ecosystems.

Native plant

In Florida, a native plant is considered to be one whose natural range included Florida at the time of European contact (around 1500 A.D.).

Naturalized plant

An exotic plant that can sustain itself outside of cultivation, that is, without human care or assistance.

Species

A subdivision of a genus, considered as a basic biological classification and containing individuals that resemble one another and may interbreed.

Materials

- Plant specimens – one or more each of a native, an exotic, an invasive species
- Computer with Internet access
- Printer
- Paper
- Display board
- Markers
- A variety of plant guides
- Tables
- Exit survey document
- Invasive Plants Photo-murals (Available for purchase from UF/IFAS. See *Resources*.)

Resources

These resources are found in the [Digital Library](#) of the Orange County Water Atlas.

[Exotic Plant Lesson Plans \(Elementary/Middle School\)](#). 2011. Florida Exotic Pest Plant Council and Manatee County Government.

Other resources:

[Florida Invasive Plant Education Initiative and Curriculum](#). University of Florida Center for Aquatic and Invasive Plants and Florida Wildlife Conservation Commission Invasive Plant Management Section.

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[Intruders in Paradise: Invasive Species in Florida](#), A Teacher's Guide. Tampa Bay Estuary Program, Florida Sea Grant, Florida Aquarium, and University of Florida Institute of Food and Agricultural Sciences.

[Invasive Plants 101](#). Florida Exotic Pest Plant Council.

[Invasive Plants Photo-murals](#). University of Florida Institute of Food and Agricultural Sciences.

Langeland, K. A. and K. Craddock Burks, Editors. [Identification & Biology of Non-Native Plants in Florida's Natural Areas](#). University of Florida Institute of Food and Agricultural Sciences.

[Non-Native Invasive Plants: An Introduction](#). University of Florida Center for Aquatic and Invasive Plants and Florida Wildlife Conservation Commission Invasive Plant Management Section.

Safety

- Students should wash hands after handling plants and not put plants in their mouths.
- Students should be cautioned not to release specimens of invasive or exotic species into waterways when finished.

Procedure:

Engage/Elicit

1. Show students several plant specimens, including at least one native and one exotic. Ask them if they know the name of each one. Ask them if they know where each of them originated. Discuss the concepts of "native" and "exotic" plants, and tell them which of your specimens are native, which exotic. Ask them what reasons they can think of for people bringing in plants from other parts of the world. Possible answers: human food, animal food, wood, medicines, fiber, herbs/flavorings, dyes, resins/gums/oils, pond or garden ornament, use in aquariums.
2. Show students specimens of several exotic plant specimens, including at least one that is not invasive, and one that is. Ask them if they know what each of them is. Discuss the concepts of "naturalized" and "invasive," and the difference between the two. Ask why they think some plants grow in Florida but do not take over and invade other habitats, but others do. Explain that some of these plants are missing things they would get at their place of origin, such as special pollinators or environmental conditions. Discuss natural predators and competition.
3. Lead the class in creating a Venn diagram on the board that shows all plants, native plants, exotic plants, naturalized plants, and invasive plants.

Explore

1. Assign or have students choose collaborative groups of 2 or 3.
2. Guide student groups to the [Orange County Water Atlas](#). To find water resources with plant data, have students choose **Topics** from the dropdown menu in the page header, then click on **Habitats & Ecology**, and **Vegetation Sampling**. Direct students to choose several of the lakes listed, and to examine the document titled **Plant Species List for Lake (lake name)** for each of

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them. They should take note of about how many different species each lake has in its list, and which plant species seem to be especially common. Each group should then choose one lake and print out its plant list. Encourage different groups to choose different lakes.

3. Guide students to the most recent list of invasive plants, found on the website of the [Florida Exotic Pest Plant Council](#) (FLEPPC). Which plants on the lake's plant list are invasive? Compile a list of the invasive plants found in and around all groups' lakes and put this list on a large class chart.
4. Instruct each group to choose one plant from the class list, with each group having a different plant. The students will gather research on their plant using information from the [Orange County Water Atlas](#), other websites, and other research material gathered by the teacher or students. Students must give proper credit for all information and/or photos used. Sample research questions may include:
 - a. Write a description of the plant.
 - b. What is the plant's country of origin and native habitat?
 - c. How long has this plant been in Florida? Why was it introduced?
 - d. In what type of habitat does the plant thrive?
 - e. What specific adaptations help this plant? How does it spread?
 - f. What type of damage is the plant doing to native plants and animals?
 - g. Is anything being done to stop this plant? Does the remedy have side effects? How much money is being/has been spent to try to get rid of it?
 - h. Draw a detailed picture of the plant.

Explain

1. Using the information they have accumulated, students will create presentations that will appeal to a range of ages from first grade to adults designed to persuade the viewer that theirs is the very worst invasive plant. Each group will prepare a Science Display board that should be visually attractive. It should include pictures, live or pressed specimens if possible, clear and easy-to-read titles and captions, and some type of graphic information.
2. The students will prepare computer-generated brochures or handouts to have available at the Exotic Plant Fair. If practical, they may prepare Power Point presentations.

Exchange/Evaluate

1. Each group of students will present their chosen plant in an Exotic Plant Fair and invite other classes throughout the school. Students will prepare visual media such as school TV announcements, posters placed around the school and handouts announcing the fair.
2. On the day of the fair, student pairs will set up their displays and be available to talk about the dangers of their plant as well as answer questions.
3. Upon exiting the fair, each visitor will vote for the three plants they feel create the most environmental problems. Since the majority of the participants will have little or no previous knowledge of exotic plants, their decisions will be based mainly on the student projects. This will help the students understand the importance of media appeal.

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4. Students will poll the participants as they leave to see why they voted as they did. The students can place the results on a bar graph and analyze it. A sample poll is found on the next page; however, the class should write their own exit poll.
5. After the fair, the students will tally the votes and then discuss why they think the three winning plants were chosen. Did specific age groups or gender groups make similar decisions? Students can analyze the data and see if the features they used in creating the board did make a difference.
6. Finally, the students will tabulate the number of people they educated over a short period of time. This will give them an idea of why mass appeal is important in getting a message across. They also need to discuss whether or not they feel the fair made a difference. Will just having a little more knowledge cause the participants to do anything about the problem?

Extend

1. Arrange a field trip for students to visit one of the lakes for which a plant list is available on the Orange County Water Atlas. How many of the plants on the list can they identify? Bring field guides to aid in identification, and drawing materials to make a sketch of any plant whose identity remains elusive, to aid in later research.
2. Students' quality of research, oral presentations, and science display boards can be used to assess their attainment of knowledge and ability to perform research and communicate effectively.

Author:

This lesson is adapted from one created by Mary Jane Meherg, Goldsboro Elementary and modified from the original lesson plan created for the Seminole County Water Atlas.

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