Classroom Teacher Preparation

Life Science 4: Invasive Species

Please use the following to prepare for the next SfS lesson.

Description:

Students explore what it means for species to be native, non-native, or invasive by using a game-model with different fish species. From their results, students identify what makes an organism invasive. They then discuss what to do with invasive species and are introduced to one method of eradication, the artificial predator Guardian LS1 robot from *Robots in Service of the Environment (RSE).*

Lesson Objectives – SWBAT ("Students Will Be Able To…"):

5th-8th

- Model an ecosystem with native, non-native, and invasive species
- Explain what makes a species invasive
- Discuss ways to eradicate invasive species

Disciplinary Core Idea (DCI)

LS2 Ecosystems: Interactions, Energy, and Dynamics

- (3rd-5th) *LS2.A Interdependent relationships in ecosystems*: The food of almost any animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants, while decomposers restore some materials back to the soil.
- (6th-8th) *LS2.C Ecosystem dynamics, functioning, and resilience*: Ecosystem characteristics vary over time. Disruptions to any part of an ecosystem can lead to shifts in all of its populations. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.

Science & Engineering Practice (SEP)

Developing and Using Models

- (3rd-5th) Use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system
- (6th-8th) Develop and/or use models to describe and/or predict phenomena.

Constructing Explanations

- (3rd-5th) Construct an explanation of observed relationships (e.g., the distribution of plants in the backyard).
- (6th-8th) Apply scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real-world phenomena, examples, or events.

Crosscutting Concept (CCC)

Cause and Effect

- (3rd-5th) Cause and effect relationships are routinely identified, tested, and used to explain change.
- (6th-8th) Cause and effect relationships may be used to predict phenomena in natural or designed systems.

Systems and System Models

- (3^{rd}-5^{th}) A system can be described in terms of its components and their interactions.
- (6^{th}-8^{th}) Models can be used to represent systems and their interactions—such as inputs, processes, and outputs—and energy, matter, and information flows within systems.

Preparation:

Students should be familiar with the concepts of food webs and ecosystems.

Room Set Up for Activities:

Students should split up into groups of 4-5 (maximum of 8 groups).

Safety:

There are no safety concerns with this lesson.

Related Modules:

This lesson may be taught as part of a sequence or group of related modules on **Human Impact**. Modules include:

Life Science 5: Food Webs - This module teaches the basics of food webs. Students first construct a food web model for a simplified Yellowstone ecosystem. They then consider what would happen to the ecosystem if the food web were disrupted by the removal of a native species and/or the introduction of an invasive species.

Engineering 6: Saving the Beach – Examines the causes of beach erosion and discuss how erosion affects a beach and its 'stakeholders'. Students work in small groups to engineer solutions to beach erosion through brainstorming, planning, and designing prototypes for their model beaches.

Technology 5: E-trashing our Future – Students get an opportunity to examine the increasing volume of e-waste in society and how our country is dealing with our technology habits.

Earth Science 1: Oil Spill – Students explore the issues surrounding an oil spill, particularly the methods of environmental cleanup as they act as environmental engineers to test different methods for effectively cleaning up a model oil spill.

For other module sequences and groups, look here: www.sciencefromscientists.org/sequences

Standards Covered:

Please click the following link to our website to review the standards covered by this lesson, listed by state: www.sciencefromscientists.org/standards/

Lessons are matched to both national NGSS and local state standards.

After Our Visit:

Extend this lesson with an online game to find and remove invasive species before they take over the habitat.

Access this Extension activity by visiting the Classroom Post found on our website at sciencefromscientists.org/cohorts. Use the name of your school/cohort and password to log in.

To help Evaluate, check out our Open Response questions online at sciencefromscientists.org/open-response-questions. They are freely available for all of our lessons for current teachers. Use the password supplied by your instructor to log in.

Additional Resources:

- Robots in Service of the Environment: www.robotsise.org
- National Ocean Service: https://oceanservice.noaa.gov/facts/lionfish.html