

Grade

4th–8th grade

Length

60 minutes

Subjects/strands

Ecology

Topics

Invasive species, biology, ecology, environmental sciences, social sciences

LEARNING OBJECTIVES

Students will (a) make observations from species on display through BioBlitz questions, and (b) conduct research in more detail on a species and present it in front of the class. This lesson may be adapted to conform to specific classroom benchmarks.

INTRODUCTION

In this activity, students will quickly record their observations of specific species on display by answering the BioBlitz questions on the data sheet. Afterward, they will research in more detail on one species, and answer the debrief questions on the data sheet. Finally, they will present the information to the rest of the class.

BACKGROUND

Invasive species are organisms that are introduced from somewhere else and quickly dominate an ecosystem. They cause problems for other plants, animals, and people. Invasive species often have physical traits that enable them to reproduce and spread rapidly and out-compete native species for resources. Their success can change ecosystems and reduce the value of the environment. Invasive species often have physical traits, such as massive root systems or the ability to resprout from fragments, that make them difficult to control.

MATERIALS NEEDED

- Large space and tables to set up one station per species
- Invasive species specimens, available in the Menace to the West Toolkit. See MenaceToTheWest.org for information about how to check out the toolkit for use in your classroom.

- Student handouts, including
 - » Introduction to BioBlitz: Procedures
 - » Data Collection: BioBlitz
 - » Data Collection: Research Single Species
 - » Data Collection: Debrief
 - » Build Your Vocabulary
- Research and/or learning materials at each station, such as
 - » Computer tablet or other device with Internet access. Students can access MenaceToTheWest.org to view videos and fact sheets on these species.
 - » Printed copies of the species guides from MenaceToTheWest.org.

VOCABULARY

Abiotic, bioblitz, biofouling, biological control, biotic, invasive species, native species, nonnative species

PREPARATION

It is useful for the teacher and students to gain some familiarity with invasive species topics before teaching this lesson. You can view an introductory video at MenaceToTheWest.org. We also suggest you read the Introduction to the *Menace to the West* curriculum, also available at MenaceToTheWest.org.

Set up each BioBlitz research station with an invasive species specimen and research materials for students to read and answer the questions on the data sheet. For example, print and place a species guide for that species, and/or have a copy of the *On the Lookout for Aquatic Invaders* identification guide at each station. Alternatively, computers with Internet access can be used for further research. Students can watch short videos about the species at each station. See the Resources section in this lesson plan for recommended websites and suggested videos.

BioBlitz!

You may want to include other invasive species from the resource list at the end of this lesson plan, or you could also bring in freshly collected invasives from your local environment, which will allow you and your students to better relate invasive species to local impacts and opportunities. Blank rows are provided on the data sheet for listing these species. While collecting local invasive species, be careful not to allow the species to spread, and dispose of them properly—in the trash, not back into the environment.

In addition, we have provided space on the Data Collection: Research Single Species student handout for a teacher-specified question that enables students to relate BioBlitz to classroom benchmarks in biology and/or environmental science. Provide this question to your students at each research station.

PROCEDURE

1 Introduction to invasive species (7 minutes)

Tell your students they will be conducting an activity called a BioBlitz, which is an intensive period of biological surveying to record living species within a designated area. A BioBlitz is typically led by scientists who work with naturalists and others, often to promote public interest in biodiversity. Today, we're conducting our own BioBlitz in the classroom. You will survey all of the species quickly at first, then select one species to study more thoroughly. Each student will then report his or her findings to the rest of the class.

2 Conduct a BioBlitz (10 minutes)

Students rotate quickly through research stations (1–2 minutes per station), reviewing the pictures or specimens and answering the BioBlitz questions on the left side of the handout.

3 Research single species (10 minutes)

Each student selects (or is assigned) one invasive species from the BioBlitz stations that are listed on the data sheet, using the resources available at the appropriate station to research and summarize the answers to the questions on the data sheet. You may want to include a question related to your specific science classroom benchmarks.

4 Students debrief and share expertise (10 minutes for three presentations)

Each student will have approximately 3–4 minutes to share information on his or her species.

5 Summary and next steps (5 minutes)

Conclude the activity by summarizing the purpose and what steps students can take next (e.g., recognizing invasive species in their environment and reporting them). In Oregon, they can report to www.oregoninvasiveshotline.org.

VOCABULARY WORKSHEET KEY

- **Abiotic:** Nonliving.
- **BioBlitz:** An intense period of biological surveying to record living species within a designated area. Typically led by scientists working with naturalists, BioBlitzes are often used to promote public interest in biodiversity.
- **Biofouling:** The attached and associated free-living organisms found on marine structures.
- **Biological control:** The control of destructive organisms by the use of other organisms, such as the natural predators of the pests.
- **Biotic:** Of or having to do with life or living organism.
- **Invasive species:** Nonnative species disrupting and replacing native species.
- **Native species:** Species that normally lives and thrives in a particular ecosystem. This can include any species that developed with the surrounding habitat, and can be assisted by or affected by a new species.
- **Nonnative species:** Species living outside captivity that did not historically occur in a particular area.

RESOURCES: BIOBLITZ VIDEOS**Freshwater vertebrates****Red-Eared Slider***

What's a Red-Eared Slider?

www.youtube.com/watch?v=RH_wZ3xjqpw

The Silent Invasion: Turtle Hunter. Oregon Field Guide

www.youtube.com/watch?v=0n6EXjdzIYQ

Red-Eared Slider Turtle in San Diego, CA

www.youtube.com/watch?v=3zASQuU-h4g

Nutria*

Following the Invasive Nutria in the Northwest

www.youtube.com/watch?v=dxWGHfeAEGI

Nutria (Myocastor coypus)

www.youtube.com/watch?v=10TP-47OrMg

Asian Carp*

Silent Invaders Asian Carp, 2013

www.youtube.com/watch?v=rPeg1tbBt0A

American Bullfrog

Huge Hand-Caught Bullfrog

www.youtube.com/watch?v=6FmXAG8GM5w

Bullfrog hunts . . . anything

www.youtube.com/watch?v=wXqK5QulbJ8

Freshwater invertebrates**Rusty/Red Swamp Crayfish***

Red swamp crayfish audio slideshow

www.youtube.com/watch?v=z6fqrrESyIE

Red Swamp Crayfish

www.youtube.com/watch?v=UCO85cSfaBE

Know Your Invasives: Rusty Crayfish

www.youtube.com/watch?v=zI4vI3TY1xI

Quagga/Zebra Mussels*

Silent Invaders

www.youtube.com/watch?v=abImqGDzXBo

Quagga Mussel in Lake Powell, ABC 4 News

www.youtube.com/watch?v=sO-NvIrr3HU

Quagga Mussels Feeding, sped up 10x

www.youtube.com/watch?v=9SK5amoShPE

New Zealand Mud Snail*

Aquatic Invaders

www.youtube.com/watch?v=s8l55WzMZR4

Freshwater aquatic and riparian plants**Knotweed***

Japanese Knotweed Damage—Eradicate Japanese Knotweed

www.youtube.com/watch?v=vpwwsG6jaro

Japanese Knotweed

www.youtube.com/watch?v=tqcS5s5GFHs

Brazilian Elodea/Hydrilla*

Elodias en el lago (Elodea in the lake)

www.youtube.com/watch?v=rOUtbTBDpxw

Environmental Laboratory, U.S. Army Corps of Engineers

www.youtube.com/watch?v=9CAkyt2vyro

Yellow Flag Iris

Yellow Flag Iris

www.youtube.com/watch?v=2IBFXRu96Lw

Yellow Iris (Iris pseudacorus)

www.youtube.com/watch?v=nLjFfsWHF9s

Purple Loosestrife

Invaders in Our Waters: Purple Loosestrife

www.youtube.com/watch?v=4I49GrYnyOU

Purple Loosestrife—A Very Wicked Plant

www.youtube.com/watch?v=TmMsI3ZYUqI

Didymo

Didymo (Montana Fish, Wildlife, & Parks)

www.youtube.com/watch?v=51GFWVE1KCA

Giant Reed (Arundo)

Arundo donax Removal

www.youtube.com/watch?v=7NMGCSxP1mQ

Marine organisms**Chinese Mitten Crab***

Chinese Mitten Crab Feeding

<https://www.youtube.com/watch?v=nSKxTFGow5c>

Chinese Mitten Crab (Eriocheir sinensis)

<https://www.youtube.com/watch?v=5HYf1c-L5ok>

Chinese Mitten Crab with ginger, Chef Gordon Ramsay

<https://www.youtube.com/watch?v=AAxm7JpeTVU>

Tunicates*

Tunicate

<https://www.youtube.com/watch?v=pqiM5wQ4Ogc>

*Indicates species included in Menace to the West Toolkit. Additional species to be added at a later date.

Caulerpa*

Invasive Species Google Earth Tour

<https://www.youtube.com/watch?v=1aSSKDrxkbg>

Undaria/Sargassum

Leatherjacket sheltered by Undaria crop

<https://www.youtube.com/watch?v=r9sDAki5DVs>

Invading Seaweed

https://www.youtube.com/watch?v=Pe_GEHir8yA

Spartina

Reflections on the Water: Identifying Spartina Grass with Rachel Benbrook

https://www.youtube.com/watch?v=3bVqQV_Th8M

STANDARDS ADDRESSED

Common Core

Reading Informational Text (Grades 3–6)

- Key Ideas and Details 3.1-3, 4.1-3, 5.1-3, 6.1-3
- Craft and Structure 3.4, 3.5, 4.4, 4.5, 5.4, 5.5, 6.4, 6.5, 6.6
- Integration of Knowledge and Ideas 6.7

Speaking and Listening (Grades 3–5)

- Comprehension and Collaboration 3.1, 4.1, 5.1, 6.1

Next Generation Science Standards

Biological Evolution: Unity and Diversity (Grade 3)

- 3-LS3-3, 3-LS4-4

From Molecules to Organisms: Structures and Processes (Grade 5)

- 5-LS1-1

Earth and Human Activity (Grade 5)

- 5-ESS3

Ecosystems: Interactions, Energy, and Dynamics (Middle School)

- MS-LS2-1, MS-LS2-4, MS-LS2-5