

## Unit 3

# Understanding Invasive Species

(informative / explanatory essay)

### Part 1: Standards Addressed in This Activity

- W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.
- W.8.2.A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
- W.8.2.B Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.
- W.8.2.C Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.
- W.8.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.
- W.8.2.E Establish and maintain a formal style.
- W.8.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented.
- W.8.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- W.8.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.
- W.8.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

## Part 2: Description of Activity

The student will create an outline by gathering information from the passages in Unit 3 and will use the outline to write an essay about invasive species in the United States. The student's essay will address four questions:

1. What are invasive species?
2. What are some of the negative effects of invasive species?
3. What can be done to lessen the negative effects of invasive species?
4. What are the potential consequences of these actions?

## Part 3: Teacher and Student Instructions

### Task A: Pre-writing

This task gives students important practice in taking notes, summarizing, and organizing, as well as presenting factual material in writing. During pre-writing, the student will think about the questions listed above, revisit the passages in Unit 3, and take notes using an outline or other graphic organizer.

Point out to students that the purpose of an informative/explanatory essay is to educate the reader by presenting facts about a certain topic. It does not include opinions or attempts to persuade the reader.

Parts of a well-written informative/explanatory essay:

- An **introduction** that
  - ✓ engages the reader
  - ✓ tells what your essay is about
  - ✓ grabs the reader's attention (using a quote, question, or interesting detail)
- **Several paragraphs** that
  - ✓ address the prompt
  - ✓ use precise language and a formal style
  - ✓ incorporate facts, definitions, concrete details, and examples
- A **concluding paragraph** that
  - ✓ summarizes the main idea of the essay
  - ✓ supports the information or explanation presented

### Using the Handouts

There are two suggestions for prewriting—students can complete an outline or a graphic organizer (or both). A completed exemplar of each is included. Students can complete this part independently, with a partner or in a small group. Or, the teacher can incorporate either of these into a whole-class prewriting activity.

**Directions for the Student**

An informative/explanatory essay is a kind of writing that provides the reader with knowledge. The first step is to gather information. Reread the text; then, record important details. Create an outline or graphic organizer.

Once your outline or graphic organizer is complete, use it to write the first draft of your essay. Afterwards, revise your first draft; then proofread and edit before submitting your final draft.

**Task B: Writing an Informative / Explanatory Essay****Prompt**

Based on the information you read in Unit 3, answer the four questions listed below. Incorporate examples from the text (Unit 3) in your explanations.

1. What are invasive species?
2. What are some of the negative effects of invasive species?
3. What can be done to lessen the negative effects of invasive species?
4. What are the potential consequences of these actions?

**Part 4: Handouts / Suggested Responses**

Invaders Outline (Blank)

Invaders Outline (Sample)

Graphic Organizer (Blank)

Graphic Organizer (Sample)

Name: \_\_\_\_\_

## **Invaders Outline**

### **I. Non-Native and Invasive Species in the US**

### **II. Brown Marmorated Stink Bug (BMSB)**

### **III. Zebra Mussel**

#### **IV. Invasive Plants**

#### **V. Invasive Birds**

#### **VI. Rat**

#### **VII. Quiz: Invasive Burmese Python**

Name: Sample

## Invaders Outline

### I. Non-Native and Invasive Species in the US

- a. Non-Native
  - i. Introduced intentionally or unintentionally
  - ii. Caused by international travel and trade (globalization)
  - iii. Can be harmful or beneficial (bees)
- b. Invasive
  - i. Introduced intentionally or unintentionally
  - ii. Caused by international travel and trade
  - iii. Harmful to economy, environment, human health
  - iv. Reproduce and spread rapidly
  - v. Have few or no natural enemies
  - vi. Example: nutria

### II. Brown Marmorated Stink Bug (BMSB)

- a. Native to Asia (China); lives in 44 states (and Canada)
- b. Characteristics
  - i. "Hitchhiker"
  - ii. Main defense is foul-smelling substance
  - iii. Wide-ranging diet (fruits and vegetables)
  - iv. Difficult to eradicate
- c. Agricultural menace
  - i. Affects at least 9 agricultural states
  - ii. Causes millions of dollars in damages to crops
- d. Home invader
  - i. Enters houses in winter
  - ii. Annoying and harmful to humans/may cause allergic reaction
- e. Possible solutions
  - i. Pesticides
    - 1. can contaminate groundwater
    - 2. may kill off beneficial insects
  - ii. Bug traps
  - iii. Samurai wasp
    - 1. natural enemy of the BMSB
    - 2. possible risk to other insect species or other unknown threat

### III. Zebra Mussel

- a. Live in 5 Great Lakes and more than 30 states
- b. Transported in ballast water
- c. Harmful to the environment
  - i. Disturbs the balance of life
    - 1. consume food and oxygen
    - 2. crowd out other species
- d. Harmful to the economy and/or human health
  - i. Decreases water quality
    - 1. reduce water flow
    - 2. obstruct drains
    - 3. damage equipment
  - ii. Pollutes shorelines
    - 1. razor-sharp shells can cut
  - iii. Absorbs pollutants and pass them on in food chain
- e. Extremely difficult to eradicate
- f. Possible solutions
  - i. No sure-fire solution
  - ii. Pesticides have been used
  - iii. Educate the public (anglers, divers, people who use waterways)
    - 1. dispose of unused bait
    - 2. completely dry all gear
    - 3. drain buckets, pumps

### IV. Invasive Plants

- a. All are introduced both intentionally and unintentionally
- b. Harmful to the economy
  - i. Cost Americans millions per year
  - ii. Degrade property values
  - iii. Hurt agriculture
  - iv. Disturb public utilities and operations
- c. Harmful to the environment and/or human health
  - i. Destroy habitats
  - ii. Crowd out native plants
  - iii. Diminish availability of water
  - iv. Deplete nutrients in soil
- d. Spreads easily
  - i. Abundance of seeds
  - ii. Far-reaching root systems
- e. Kudzu
  - i. Grows a foot per day
  - ii. Covers and smothers everything in its path
  - iii. Difficult to eradicate
    - 1. vines grow back if cut, burned, or dug out
    - 2. owners must work together across property lines
    - 3. herbicides can harm native organisms and pollute waters

## V. Invasive Birds

- a. Harmful to the economy
  - i. Hurt agriculture
  - ii. Disturb public utilities and operations
  - iii. Droppings clog drainage systems, damage roofing
  - iv. Bird strikes damage planes
- b. Harmful to the environment and/or human health
  - i. Competes with native species
  - ii. Causes overgrazing
    1. decreases natural vegetation
    2. leads to soil erosion
    3. destroys habitats
  - iii. Droppings are messy and unpleasant
    1. pollute environment
    2. degrade water quality
  - iv. Bird strikes are dangerous to human lives
- c. European starling is most invasive bird in US
  - i. Introduced intentionally to control agricultural pests
  - ii. A pest of today
    1. damage agricultural products
    2. cause contamination and disease
- d. Mute swans
  - i. Introduced intentionally for their beauty and grace
  - ii. A pest of today—large and vicious
    1. push out native species; aggressive toward humans
    2. consume and destroy plants other species need
- e. Possible solutions
  - i. Poisons, traps, natural remedies do not eradicate
  - ii. Can only be controlled by limiting food supply

## VI. Rat

- a. Highly invasive; lives all over the world
- b. Prefers to live near humans
- c. Harmful to the economy, environment, and human health
  - i. Competes for food
  - ii. Preys on native animals
  - iii. Endangers native organisms; has helped cause extinctions
  - iv. Damages crops; invades food stores; spreads disease
  - v. Chews through electrical wires, water pipes, and insulation; causes structural damage
- d. Has many characteristics that make it successful
  - i. Quick, agile, and mobile
  - ii. Expert hitchhiker
  - iii. Highly adaptable and aggressive; able to flourish anywhere
  - iv. Omnivorous
  - v. Extremely prolific and able to reproduce when young



## VII. Invasive Burmese Python

- a. Introduced in North America as part of pet trade
  - i. A favorite among reptile owners
  - ii. Escaped or were released by overwhelmed owners
    - 1. requires large amount of living space and food
    - 2. requires temperature and humidity-controlled enclosure
    - 3. can transmit salmonella poisoning to humans
- b. Powerful predator, capable of killing and eating large animals
- c. Feeds on medium-sized mammals, birds, and alligators
  - i. Some of its prey are threatened or endangered species
- d. Executes by constriction
- e. Many traits make them successful in southern North America
  - i. Grows rapidly
  - ii. Fully grown is 16 feet or more and hundreds of pounds
  - iii. Live in trees when young
  - iv. Adult is ground-dwelling but also a good swimmer
  - v. Habitat generalist
  - vi. Reproduce rapidly
- f. Extremely invasive in Everglades National Park
- g. Federal law bans import and export

Name: \_\_\_\_\_

## Invaders Graphic Organizer

Paragraph and Purpose		Reasons and Evidence
<b>1</b>	<b>Introduction: What are invasive species?</b>	
<b>2</b>	<b>What are some of the negative effects of invasive species?</b>	
<b>3</b>	<b>What can be done to lessen the negative effects of invasive species?</b>	
<b>4</b>	<b>What are the potential consequences of these actions?</b>	
<b>5</b>	<b>Conclusion:</b>	

Name: Sample

## Invaders Graphic Organizer

Paragraph and Purpose		Reasons and Evidence
1	<b>Introduction: What are invasive species?</b>	May be plants or animals; introduced intentionally or unintentionally; mostly due to globalization/international travel and trade; always harmful to economy, environment, human health; characteristics: reproduce and spread rapidly; have few or no natural enemies Examples: nutria, BMSB, zebra mussel, kudzu, European starling, mute swan, rat, Burmese python
2	<b>What are some of the negative effects of invasive species?</b>	Economy: wipe out vegetation, harm crops (BMSB); damage infrastructure (zebra mussel, rats) and farmland (nutria, rats); Environment: cause erosion, habitat loss; crowd out native species (birds, nutria, python) and threaten endangered species, cause pollution, hurt water supply (kudzu, birds), Human health: pass on pollutants through the food chain (zebra mussel), cause pollution, spread disease (birds, rats)
3	<b>What can be done to lessen the negative effects of invasive species?</b>	Eradication is difficult, often impossible; few or no natural predators; reproduce and spread faster than can be killed; poisons, pesticides, bug traps; cutting, burning, digging out plant roots; precautions taken by people who use freshwater lakes; removing food supply; federal law (Lacey Act)
4	<b>What are the potential consequences of these actions?</b>	Pesticides contaminate soil and water; samurai wasp—too many unknowns; species may respond by intensifying reproduction (rats)
5	<b>Conclusion:</b>	Main cause of invasive species is human activity (globalization, transportation & trade); eradication impossible; control/prevention may be possible; requires education, cooperation, and care