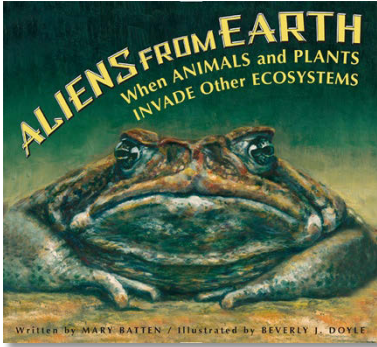


TEACHER'S GUIDE



Aliens from Earth

When Animals and Plants Invade Other Ecosystems (revised edition)

Written by Mary Batten | Illustrated by Beverly Doyle

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Ages 8–12 | Informational

AR • RC • Lexile • F&P • GRL X; Gr 6

ABOUT THE BOOK

Some early colonists took rabbits and foxes to Australia for hunting; others took domestic cats to reduce the stowaway rat population brought over on their ships. These introduced animals, having no natural predators in Australia, rapidly multiplied and decimated many of the unique marsupials living there. This type of invasion and subsequent taking over of an area has occurred numerous times. Invaders not indigenous to ecological regions have often harmed or destroyed the native species of those areas. The speed and ease of modern transportation has increased this activity. Both unwitting and deliberate introductions of foreign or alien species have had drastic consequences on native populations throughout the world.

In this picture book, Batten describes a variety of introduced species and the effects they have had on the existing populations in ecosystems across the world. From Africanized honeybees to zebra mussels, she traces the introduction of alien species and the impact these newly arrived organisms have had on the environment. The final page gives suggestions for limiting these alien invasions.

THEMES

- Introduction of organisms into environments
- Human impact on the environment
- Extinction of animals
- Ecological habitats
- Predator-prey relationships

BEFORE YOU READ

- Before reading the book, have students fill out the “Anticipation Guide” included at the end of this Teacher’s Guide. Instruct the students to either agree or disagree with each statement.
Note: Have students answer the anticipation guide questions again after reading the book and doing the activities in this guide. Then compare their second answers to their first answers and discuss the differences.
- Provide a list of the glossary words and review their meanings. One way to do this is to have a treasure hunt for the definitions. This will allow for differing abilities in your class. Assign groups of two or three to find as many of the words as possible. Students may use a variety of sources to search for word meanings. Ask them to write the definition on a small chart or sentence strip. Have each group research all the words, or assign certain words to individual groups. Ask each group to report back to the class with some of their words until all words are defined. Post the definitions around the room.
- Use a map to find the following locations: Africa, Australia, Hawaii, North America, New York, United States, Europe, Massachusetts, New England, South America, Alabama, California, Brazil, Central America, Japan, Marshall Islands, and Pennsylvania.

AS YOU READ

- Use the “Guided Reading Questions” reproducible page of fill-in-the-blank questions included with this guide to help students focus on reading. There is an

answer key on page 5 of this guide.

- Use the “Reading Organizer” at the end of this guide to have students keep track of each alien as it was introduced, where it came from, where it was introduced, when it came, who brought it, how it was brought and/or the reason it was brought.
- Ask students to keep a reading journal as the book is read. Have them write down thoughts and questions that come to mind during the reading.

AFTER YOU READ

- Have students choose a word from the book or from the glossary and write the word so that the letters and shape form an idea of the meaning. Example:
Migration
M
I
G R
A
T
I O
N
- Write the chosen word on the board and have students create a list of words beginning with each letter. Each word in the list should help readers comprehend the meaning of the chosen word.
Example: Migration
M moving
I immigrant
G go
R regions
A another place
T travel
I into
O one or many
N new place
- Using the vocabulary list, ask students to write each word and a definition. They can cut out pictures from magazines that symbolize or illustrate each word. Then, have them write a paragraph about how this particular picture symbolizes the meaning of the word. Lower level students can write a sentence instead of a paragraph. Example: To illustrate the word migration, a student might cut out a picture of a moving van.
- Have students use the book to write questions about the different aliens. Write some fill-in-the-blank questions and some short essay questions. An answer key must be included in the back.
- Students can choose three of the aliens from the book and compare their effects on the environment.

- Ask each student to make a graphic of his/her own showing three to five aliens and relating them in some way.
- Read the following paragraph aloud and then ask students to compose a letter about the issue presented:

A bill in the state Senate has been introduced suggesting that an alien species of lizard be brought into your state to help control the growing insect population. Write a letter to your local paper explaining why this is not necessarily a good solution to the problem.

- Ask students to argue the opposite point of the book, suggesting a situation where it might actually be beneficial to introduce a new species to an ecosystem.
- Use one example of an alien introduction in a community and have students rewrite it as a newspaper column. Be sure they include their bylines.
- Choose one of the aliens from the book and have student(s) “report” this news story to your community. Announce the news that an alien was introduced to your community some time back and report the effects it has had on the ecosystem in your area.
- Ask students to choose one of the incidents in the book and write about what might have occurred if the alien had never been introduced into the new ecosystem. They should describe the ecosystem as it looks today without the alien.
- As a class, find out about the native trees and plants in your community or state. Report on two or three of them. Write a proposal to plant a tree, shrub, or flower on your school property. Compose a letter requesting permission, explaining why this would be a good thing to do for your school.
- Have students draw and label five of the animals or plants mentioned in the book. Then, write a sentence explaining each drawing. Write four to five sentences summarizing the consequences each alien has had on the community where it was introduced.
- As a class, research the origins of Earth Day. Write a report about it. Find out what your community does for Earth Day. Plan an Earth Day celebration for your school.
- Find out about other plants and animals that have been introduced into your area or into another region of the United States. Ask students to choose one and write a report about it. Be sure they include the following: How did these aliens get introduced? How have those aliens affected the native species in that habitat? What are people doing to control the aliens? Are there organizations in your state that are trying

to educate the public about this problem, to encourage the planting of native species, or to combat invasive species? (Some suggestions for research: Japanese honeysuckle, English ivy, Scotch broom, eleagnus privet, purple loosestrife, water hyacinth, melaleuca tree, flathead catfish.) Many state branches of the U.S. Fish and Wildlife Service have invasive species programs. The Plant Conservation Alliance has a program called Weeds Gone Wild: Alien Plant Invaders of Natural Areas. More information and plant lists are available at www.nps.gov/plants/alien.

- Have students think of a problem that could possibly be solved by introducing an alien species to an area. Ask them to make a list of possible outcomes to solving the problem in this way, showing pros and cons. Using poster board or a large sheet of paper, the students can illustrate the alien species and a possible outcome of introducing it into a new habitat. Students could also write reports about the problem, coming to a conclusion as to whether it would ultimately be more beneficial or more harmful to introduce the new species to solve the problem. They might also try to come up with alternate ways to solve the problem. The reports can be presented orally to the rest of the class.

CLASSROOM ACTIVITIES

SCIENCE

Using a set of magnifying glasses or handheld magnifiers, take a field trip around the school looking for aliens. Before you leave the classroom, give students some suggestions of objects that might be in places where they don't belong, like gum in the water fountain, a scrap of paper in the hall, etc., so they understand what they will be looking for. Examine the aliens you find. Make notes about where they are found; speculate about how they might have gotten there and what will happen to them. Describe the aliens using the five senses. Record how many items are seen more than once. Measure and record quantitative information. Write up your observations when you return to the classroom. Qualitative observations will be ones you observed using your senses. Quantitative observations will be those you measured or counted.

MATH

- Kudzu grows at a rate of up to one foot per day. Given this statistic, have groups of students determine how long it would take for a kudzu vine to completely

cover different objects in your classroom. For example, have one group measure a window, another group measure the blackboard, and another group measure a wall of your room. The measurements should be in square feet. Then assign groups to create posters with pictures and dimensions of their measured objects and the caption, "Kudzu can cover this in ___ days!" Hang these pictures throughout the room.

- Use the list of animal heights and weights to create a bar graph. You can use this list or assign the animals to students who can look up the heights and weights. Then compile data into a chart and create a graph.

Animal	Length	Weight	Height
red or gray fox	23–27 in.	8–11 lbs.	
koala	25–30 in.	15–30 lbs.	
cane toad	9 in.		
rabbit, cottontail	21.5 in.	6 lbs.	
brown rat	8–10 in.	up to 16 oz.	
mongoose	16 in.		
starling	7.5–8.5 in.		
fire ant	.25 in.		
zebra mussel	2 in.		
crayfish	2–6 in.		
pilot whale	14–21 ft.	.75–2.5 tons	
dingo		20–45 lbs.	24 in.
monitor lizard	4 ft.		
iguana	up to 6 ft.		
hamster	11 in.	32 oz.	

SOCIAL STUDIES

- Research local Native Americans who once lived, or still live, in your part of the country. Have students compare the changes that happened in their environment to the changes caused by aliens in the book.
- Research the "Trail of Tears." Ask students to report on the events that happened to the Cherokee people as they were forced to leave their homelands and relocate.
- Use the example of Christopher Columbus in the Indies, Cortez and the Aztecs of Mexico, Pizarro and

the Incas of Peru, or other early explorers to compare or contrast with the aliens in the book.

- Create a timeline of the aliens and when they were introduced into the different communities.
- Study viruses, bacteria, and communicable diseases. Have individual students or small groups research and report on different illnesses like the common cold, chicken pox, influenza, polio and other diseases they may know. Describe how these germs are aliens in the body. Compare these germs to the aliens in the book.

LANGUAGE ARTS

- As a class, use the glossary words and the following suffixes and prefixes to determine the definitions. Discuss how prefixes and suffixes change the meaning of words and launch a word-part study. Look for words in their reading vocabulary or spelling words to analyze.

Prefixes

bio
ecol
en
ex
pre

Suffixes

ity
ment
ation
ism
or
ite

Meanings:

bio = life	ity = state of being
ecol = house	ment = action or process; product
en = in	ation = that which is
ex = out	ism = doctrine; belief
pre = before	or = person who
	ite = rock or mineral

WRITING

- Early grades: Find books or articles about any of the organisms from the book. Assign each student a different organism. The student must write five sentences using facts about that alien or organism and five opinions about the alien. Discuss the differences between fact and opinion.
- Upper grades: Students can write a report or research paper about one of the aliens or organisms from the book.
- Ask students to write their own creative story about an alien based on their discovery from the science activity. Or, they can write a story about an alien from his/her imagination.

ART

- Make a banner: "Did You Know This Was an Alien?" Using large poster board or butcher/craft paper, have students select a section of the book to do their own mural. Post murals around the school.
- Use the included template or have students research and sketch their own kudzu leaves. Twist green craft paper to make the vines and staple or glue leaves to the vines. Cover one area of the room or all over the room. Drape the kudzu over an item in the room to show how kudzu makes a silhouette of what it covers.
- Make kudzu vines on a smaller scale using pipe cleaners and green construction paper for the leaves. Construct a fence using Popsicle sticks and cover it with kudzu. Make an entire village and add the kudzu.
- Create a collage around a theme. Introduce a discordant piece into the collage that does not fit into the theme of the overall piece. Example: Create a collage about water. Introduce a tissue or six-pack drink plastic ring holder into the picture. Discuss how this changes the feel of the collage after it is completed. The students could possibly complete their collages, then exchange them (or keep them) and add the alien piece of art.

DISCUSSION QUESTIONS

1. Define alien as it is used in the book. (p. 3)
2. What does the word "exotics" mean? (p. 3)
3. What effect can an alien species have on the ecosystem? (p. 3)
4. Name three ways plants and animals were spread from one place to another. (p. 3)
5. Why did the human population begin to spread? (p. 4)
6. Why can aliens spread faster in today's world? (p. 4)
7. Why are populations on islands more easily destroyed by invading aliens? (p. 6)
8. What happened to some of Australia's unique marsupials? (p. 9)
9. How does the rabbit pest problem affect Australia today? (p. 9)
10. Why is Hawaii's bird extinction rate one of the highest in the world? (p. 10)
11. What alien introduced into New York in the 1890s took over the habitat and food of many native birds? (p. 13)
12. What was the original purpose for introducing the gypsy moth? (p. 14)
13. How do people unknowingly carry the gypsy moth eggs from place to place? (p. 14)

14. What is the actual name of the killer bee? (p. 16)
15. From what country were fire ants accidentally introduced to the U.S.? (p. 19)
16. What is a ballast tank? (p. 21)
17. How can a ballast tank spread aliens? (p. 21)
18. What damage do zebra mussels cause? (p. 21)
19. How did the brown tree snake enter Guam? (p. 22)
20. Why did the U.S. government introduce kudzu? (p. 25)
21. How fast can kudzu grow? (p. 25)
22. What alien animal did Micronesians bring in to control a growing rat population? (p. 26)
23. Why did the U.S. bring in Asian carp? (p. 28)
24. What effect can smuggling exotic animals have on a habitat? (p. 31)
25. Tell three ways you can help keep aliens from invading your habitat. (p. 32-33)

ANSWER KEY

Guided Reading Questions Reproducible Page

1. ecosystem, p. 3
2. exotics, p. 3
3. biodiversity, organisms, p. 3
4. extinct, p. 3
5. habitat, p. 4
6. balance, p. 4
7. islands, p. 6
8. Australia, p. 6
9. migrated, p. 9
10. extinction, p. 9
11. predators, p. 9
12. habitat, p. 10
13. extinct, p. 120
14. species, p. 13
15. predators, p. 14
16. offspring, p. 16
17. population, p. 19
18. ballast, p. 21
19. populations, p. 21
20. ballast, p. 21
21. birds, p. 22
22. vine, p. 25
23. covering, p. 25
24. illegally, p. 31
25. habitat, p. 33

RELATED READING

Other books to introduce to your class about ecology, pollution, ecosystems, and other instances of "alien invasions":

The Dynamic Great Lakes, by Barbara Spring

Everglades, by Jean Craighead George

Just a Dream, by Chris Van Allsburg

The Lorax, by Dr. Seuss

Oil Spills (Our Planet in Peril), by Jillian Powell

Out of Sight: Pictures of Hidden Worlds, by Seymour Simon

There's a Zoo on You, by Kathy Darling

There's Still Time: The Success of the Endangered Species Act, by Mark Galan

The View from Saturday, by E. L. Konigsburg

The Wump World, by Bill Peet

REVIEWS

"...from the book title and first line of text to the information-packed, full-page color illustrations, this overview of ecological missteps is nonstop intriguing... Lively personal-interest reading, this picture book for older children is fast moving, clear, and well detailed."

—**Booklist**

"This visually striking and readable title describes what happens to ecosystems when alien plants or animals are introduced by accident or intention..."

The examples throughout are thought provoking, the illustrations outstanding, and the concluding words on steps to take to keep aliens out are helpful and practical. Doyle, who specializes in environmental art, provides handsome, double-paged portraits of animals both native and new to their natural habitat, using a footnote to clue readers into which are which.

Fascinating." —**Kirkus Reviews**

"The spreads are beautifully illustrated with animals and plants that almost seem to jump off the pages. Everything depicted is labeled, and a helpful key designates which ones are native, endangered or threatened, alien, or extinct... Visually appealing, it should capture the interest of browsers."

—**School Library Journal**

“Invasive species are a real and imminent global threat.

Aliens from Earth does a good job of delivering this message by explaining how invasive species destroy ecosystems and threaten other species' existence...

Batten delivers an important message, with clear instructions to readers as to how they can minimize invasive species.”

—***Science Books & Films***

AWARDS

- NTSA Recommends —National Science Teachers Association
- Conservation Book of the Year Award —Izaak Walton League of America
- Louisiana Young Readers' Choice Award —Louisiana Center for the Book
- Young Hoosier Book Award (nominee) —Indiana Library Federation
- Prairie Pasque Award —South Dakota Library Association

ABOUT THE AUTHOR

Mary Batten is an award-winning writer for television, film, and publishing. Her many writing projects have taken her into tropical rainforests, scientific laboratories, and medical research centers. She was nominated for an Emmy for her work on the Children's Television Workshop's science series *3-2-1 Contact*, and she has written more than fifty nature documentaries for television series, including the syndicated *Wild Wild World of Animals*. Mary is also the author of many children's books, among them *Baby Orca*, *Baby Wolf*, *Aliens from Earth*, *Please Don't Wake the Animals*, and *Anthropologist: Scientist of the People*.

www.marybatten.com

ABOUT THE ILLUSTRATOR

Beverly Doyle's interest in the natural world can be traced back to her childhood growing up on an old farm in Shrewsbury, Massachusetts. It was there that she began to draw animals and learned the importance of all species. She graduated from Framingham State College with a major in Fine Arts and continued her studies at Art Center College of Design in Pasadena, CA. Beverly, a freelance artist specializing in wildlife and environmental illustration, also illustrated *What the Sea Saw*. She currently lives in Vermont.

Peachtree Teacher's Guide for

ALIENS FROM EARTH

prepared by Shirley Smith Duke and Rebecca McKee

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Anticipation Guide
Aliens from Earth

Name _____

Before you read this book about aliens, answer the survey. There are no right or wrong answers. Just indicate whether you agree or disagree with the statements.

	I disagree with this statement	I agree with this statement
1. All aliens are from outer space.		
2. There are no aliens on Earth.		
3. People can change their environment.		
4. Sometimes it is good to change the environment.		
5. Bringing new plants to an area doesn't hurt anything.		
6. One way to kill harmful animals is to introduce new animals to eliminate them.		
7. People are never aliens.		
8. Islands are isolated so it is difficult to bring in new plants and animals		
9. Transportation is different today than it was 100 years ago.		
10. There are so many kinds of plants and animals that people don't need to worry if some die out.		

Reading Organizer
Aliens from Earth

Name _____

While you read the book, complete the chart below with each alien the book introduces.

What's the alien?	When did it arrive?	Where did it come from?	Where was it introduced?	Who brought it?	Why/how was it brought?

Guided Reading Questions

Aliens from Earth

Name: _____

1. Aliens are plants or animals that invade another _____—a natural community of plants and animals living in balance with one another.
2. Scientists call these aliens _____, a word that means “to come from outside.”
3. A healthy ecosystem needs _____ (a variety of living _____) and a balance between predator and prey.
4. Over thousands of centuries, ecosystems changed; some species became _____, and new ones evolved, but the pace was slow.
5. Wherever people settled, they changed the _____.
6. It is becoming harder to maintain the delicate _____ in the world’s ecosystems.
7. _____ are especially vulnerable to aliens.
8. Even a large island continent like _____ can suffer damage from such alien invasions.
9. When people _____ to new lands, they sometimes took alien species with them.
10. The cats and foxes feasted on some of Australia’s unique marsupials and ate them into _____.
11. Without natural _____, the rabbit population also exploded.
12. No one suspected that these little fern ponds would one day become a perfect _____ for mosquitoes, an insect that did not inhabit Hawaii at that time.
13. Many kinds of honeycreepers, Hawaii’s most famous birds, are now _____.
14. Aggressive birds called starlings compete with native birds for food and take over the nests of some _____.
15. Without many _____, the gypsy moth population exploded.
16. The _____, of African bees and honeybees, are called Africanized bees.
17. Without any predators, the fire ant _____ grew quickly.
18. Many aliens arrive in the _____ tanks on cargo ships. These large tanks of seawater, which help ships stay balanced, are like aquariums in the middle of the ship.
19. Huge _____ of these mussels live on submerged rocks, concrete, wood, and metal.
20. The United States now has rules to control the dumping of _____ water.
21. Over the years, the brown tree snake has eaten most of Guam’s _____ into extinction.
22. Kudzu is a fast-growing green _____.
23. It severely damages forests by _____ trees and preventing them from getting sunlight.
24. Some people _____ carry exotic animals across borders to sell or to keep as pets.
25. The place where you live is your _____.

Kudzu Leaf Template
Aliens from Earth

