

CCSS-Aligned Curriculum Guide

Grades 5 - 8

Zoo Scientists to the Rescue

By: Patricia Newman and Annie Crawley

This text would pair well with units of study that examine the following:

- Science - Conservation, Endangered Species, Habitats, Scientific Investigations
- Literacy - Comprehension, Media
- Genre - Informational



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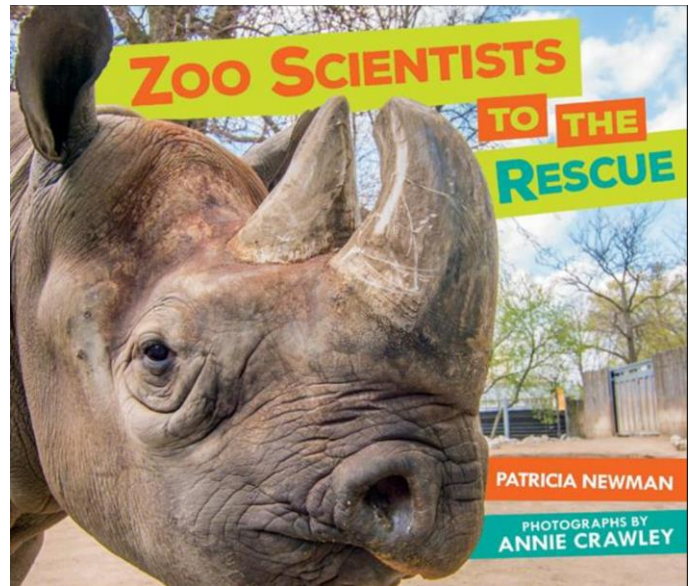


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About the Author

Patricia Newman is a graduate of Cornell University and a former teacher who enjoys the process of discovery and learning. As the award winning author of several books and magazine articles, she enjoys crafting intriguing aspects of the real world into books for children. She is available for author visits and presentations.

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About the Photographer

Annie Crawley specializes in the underwater realm as an underwater photographer, filmmaker, educator, and ocean advocate. As a producer, Annie Crawley created an award-winning series of children's ocean books, eBooks, DVDs, and educator guides. She's a dynamic and entertaining professional speaker empowering audiences to "Dive Into Your Imagination!"

For more information, visit her website at www.anniecrawley.com or email her at annie@anniecrawley.com.

Book Summary

Zoos take care of animals and welcome visitors of all ages, but that's not all zoos do. Author Patricia Newman and photographer Annie Crawley bring readers behind the scenes at three zoos to meet zoo scientists working to save endangered animals.

Meredith Bastian's experiences studying wild orangutans help educate both zoo visitors and the zoo workers who care for captive orangutans. Jeff Baughman breeds black-footed ferrets and reintroduces them into the wild. Rachel Santymire examines poop from black rhinoceroses at the zoo and in their natural habitat to benefit all black rhinos. Find out how zoo scientists are helping us learn more about these remarkable, at-risk species. Get inspired to act, before it's too late!

#ProtectOurWorld

Lesson Plan - Introduction Activity

Building Prior Knowledge

After reading the introduction, instruct students to respond to the prompt in a Quick-Write:

“What makes a zoo special? Why do you think so?”

Ask students to be as specific as possible and to justify their thinking. Allow them to use personal stories if needed. Afterwards, engage students in a class discussion about what they wrote. Allow students an opportunity to share their opinions and reasoning.

After reading the book, allow students to reread their Quick-Write to see how their ideas may have changed or evolved.

CCSS Anchor Standards

W.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 tasks, purposes, and audiences.

SL.1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.



Lesson Plan - Chapter One: Treetop Teachers

Making Observations

In this chapter, students will read about how Meredith spent seven years observing orangutans. Read the following sentence aloud from page 15: “The data she and her colleagues gathered added new chapters to the orangutan’s story and taught Meredith much more about the nature of wild orangutans than she could learn from scientific papers.” Ask students, “What do you think this means?” Focus on the importance of observational research and literature reviews.

Encourage students to do some observational research. First, discuss these questions: “What can you learn about a living thing through observation? What is the role of a scientist during observational research?” Make sure students understand that their role is to look, listen, and take lots of notes; they should avoid intervening.

Assign students to work in pairs. Lead students outside (to the field, a nearby park, etc.) and challenge them to find one living creature to observe. Have students record their thinking in their science notebooks using this chart:

I see/hear/smell/feel.... (Observations)	I wonder... (Hypothesis)	I think this means... (Conclusions)

Remind students that observations involve all five senses, but discourage the use of taste for this activity. Have them record their observations in the first column. Have students write their questions in the middle column. Tell them to use their observations to draw conclusions, in turn, answering their questions. Have students record their conclusions in the last column.

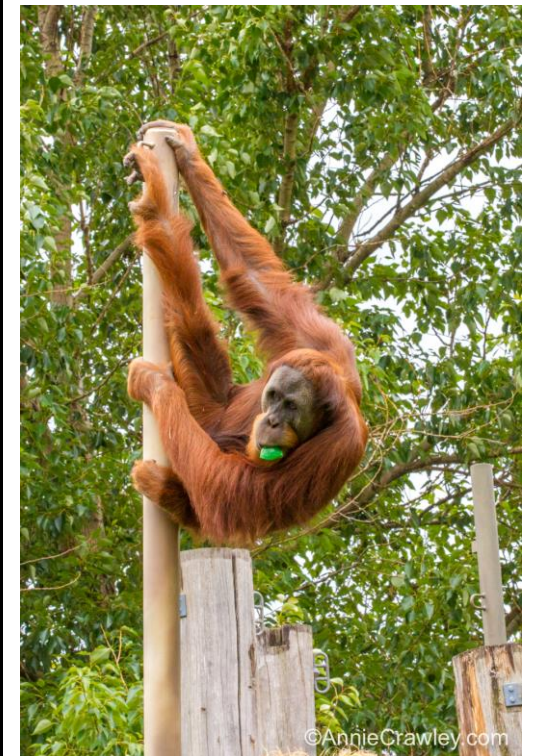
Bring students back to the classroom and convene as a whole group to discuss their data. Ask, “What did you learn about collecting data? What tools or conditions would have helped you to make better observations? Would these tools provide answers to any remaining questions you have?”

Have students re-read page 15. Have students respond to this prompt: “Why do observations sometimes teach scientists more than books and research can?”

CCSS Anchor Standards

NGSS Practice 3: Planning and Carrying Out Investigations: “...Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon...”

SL.1 Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively



Lesson Plan - Chapter One: Treetop Teachers

Finding Multiple Perspectives

After reading the chapter, give each student sticky notes. Have students write the main ideas of the wild orangutans' story.

For example:

Wild Orangutans live only in Sumatra and Borneo (10).	Farmers burn the forests on these islands for Palm Oil (10).	Orangutans live in isolated forest fragments and struggle to find food (10).	Competition for food and shelter increased (16).	Wild Orangutans are at risk and starving (10, 16).
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Have students work in small groups. Ask, "How do zoo scientists, such as Meredith, help to change the orangutans' story?" Have students use a different color sticky note or pen to add their ideas.

For example:

Zoos (such as the National Zoo) take in Orangutans to help them survive (9).	Scientists raise awareness for consumers to stop buying from these farmers (11, 18).	The Philadelphia Zoo and SOCP created drones to monitor the Orangutan's nests (12).	Scientists (like Meredith) observe in the wild in order to find solutions (16).
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Reread the last sentence of the chapter: "Because of Meredith, zoo visitors—and you—are now part of the orangutan's story." On another colored sticky note or with a different colored pen, ask students to add how they can make a positive impact in the orangutans' story. Students might write:

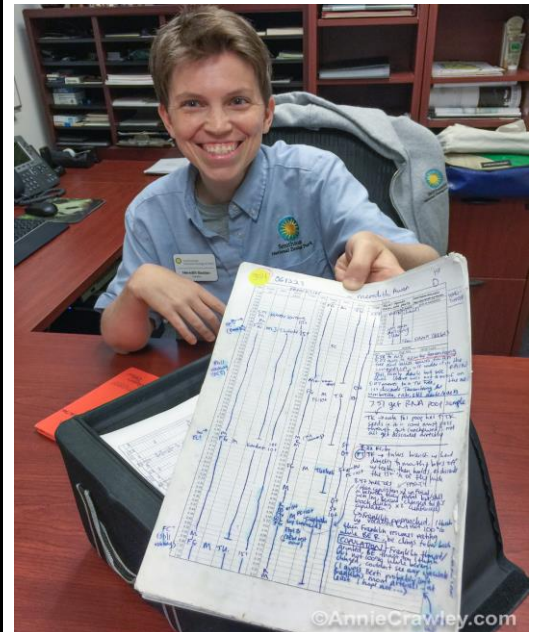
Download The Cheyenne Mountain Zoo Palm Oil app to only buy orangutan friendly products (11).	Spread the word to friends and family to stop buying palm oil from these farmers.	Become an orangutan scientist
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As a whole class, discuss how everyone has a role to play in order to protect and serve nature. Ask: "What are the different perspectives of this issue?"

CCSS Anchor Standards

R.2 Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas

R.3 Analyze how and why individuals, events, or ideas develop and interact over the course of a text.



Lesson Plan - Chapter Two: The Comeback Kits

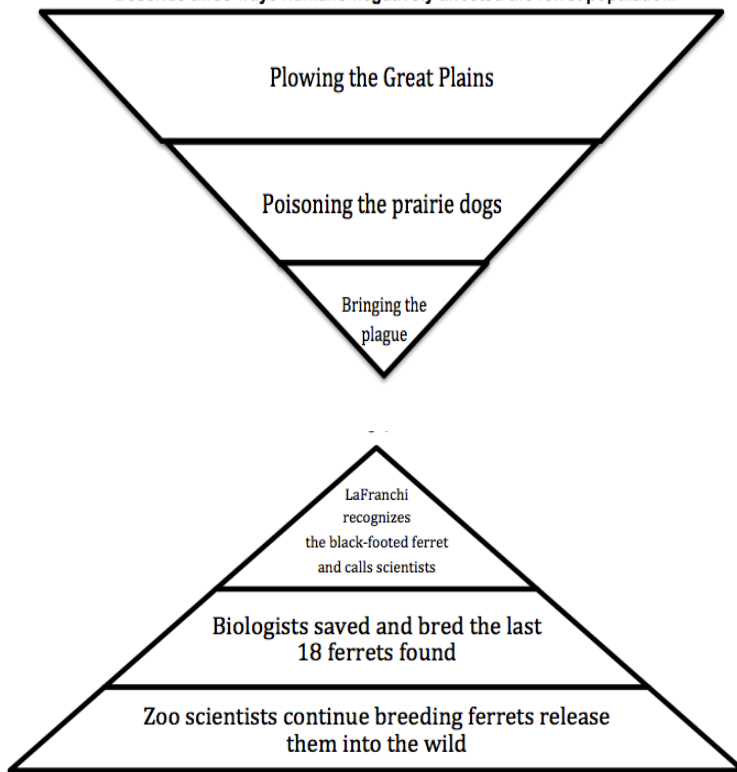
Identifying Positive and Negative Effects

Before reading this chapter, review the definitions of “causes” and “effects.” Also, review the definitions of “positive” and “negative.” Tell students that they will be identifying effects as they read.

As students read this chapter, distribute and review the graphic organizer on page 6 of this curriculum guide. Tell students to identify humans’ effects on the ferret population. Make sure students cite page numbers for each fact. Have students decide if the effects are negative or positive.

Student responses might include:

Describe three ways humans negatively affected the ferret population.



Convene as a whole group and discuss the ways humans have affected black-footed ferrets. Ask students: “Is human intervention always intentional? Is human intervention good or bad? What makes you think so?” Have students explain their thinking using examples from the text.

CCSS Anchor Standards

R.2 Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

R.3 Analyze how and why individuals, events, or ideas develop and interact over the course of a text.



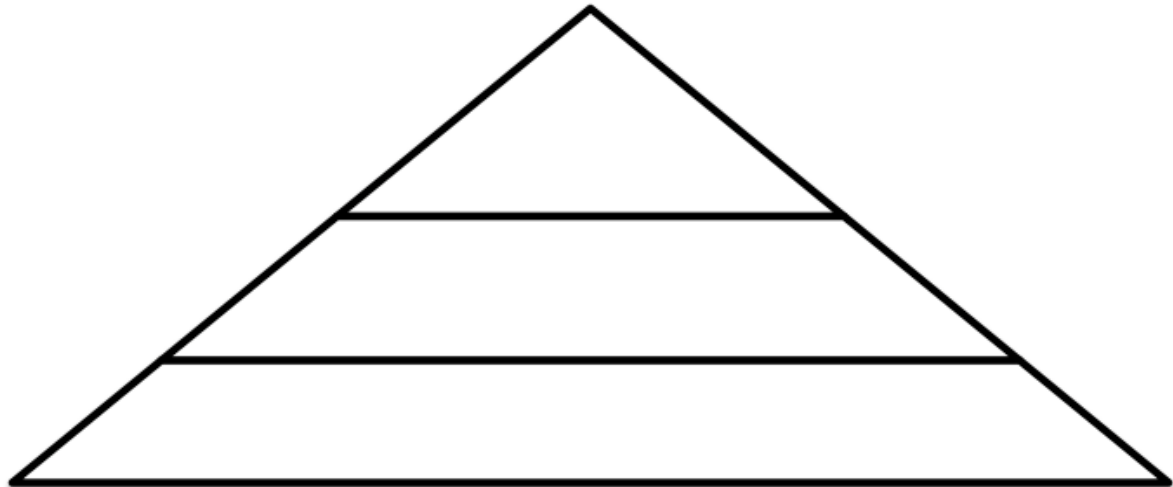
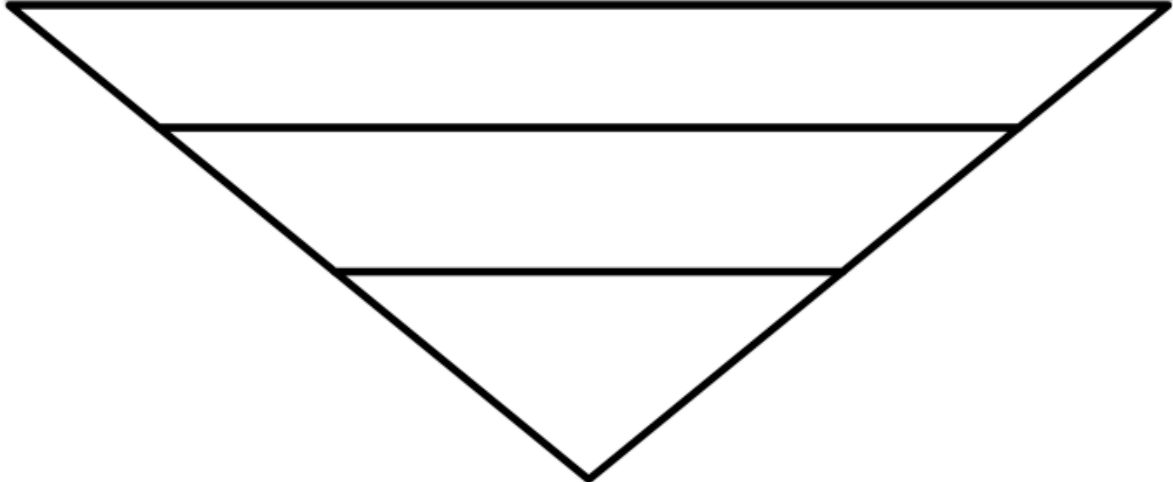
Name _____

Date _____

Humans and Black-Footed Ferrets



Describe three ways humans **negatively** affected the ferret population.



Describe three ways humans **positively** affected the ferret population.



Lesson Plan - Chapter Two: The Comeback Kits

Identifying Problems and Solutions

Set the purpose for reading by saying, “Read to identify problems and solutions in a non-fiction text.” Have students re-read pages 27-31. Have students complete a T-Chart graphic organizer to identify the problems black-footed ferrets encountered and the solutions Jeff Baughman created. Some responses may include:

Problems	Solutions
The ferrets need to be ready to be released into the wild (28).	Jeff provides ferrets with “enrichment activities” such as the empty paper bags that help the ferrets build muscle and skills they will use in the wild (28).
Ferrets have weak immune systems (27).	Jeff disinfects himself before entering the lab and wears a mask (27). Kits are vaccinated (31).
Ferrets know when to breed based on the amount of daylight (28).	In order for the ferrets to breed indoors, Jeff adjusts the lights weekly (28).

Assign students to work in small groups. Task each group to develop a plan to help black-footed ferrets. Pose the following scenario: “Imagine that Jeff Baughman needs your help! On page 32, you read: ‘At boot camp, the kits and breeding adults must learn three skills: (1) navigate an underground burrow system, (2) use the burrows as shelter, and (3) hunt prairie dogs while in the burrows.’ Suppose that not enough ferrets are passing the ferret boot camp. Help Jeff solve this problem!” Tell students to do the following:

- Choose one of the three skills.
- Create a solution to help ferrets develop the skill.
- Use your imagination and information from text about ferrets to create a solution.

Give students options to present their plan: (1) Write and draw, (2) Create a poster, or (3) Create an online presentation.

CCSS Anchor Standards

NGSS Practice 6: Constructing Explanations and Designing Solutions: “...Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution...”

R.2 Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.



Name: _____

Chapter Two : The Comeback Kits

Date: _____

Problems

Solutions

Lesson Plan - Chapter Three: Feces Saves Species

Building on Prior Knowledge

Engage students with a KWTL chart.

What do you already KNOW?	What do you WANT to know?	What do you THINK is the answer?	What did you actually LEARN?

Before reading, ask students: “What do you already know about black rhinos? What do you want to know? What do you think is the answer? What makes you think so?” Then, after reading, revisit the KWTL chart and ask, “What did you actually learn? Were you right or wrong?” Record students’ response on the chart.

Building Comprehension

Give students a focus for reading by providing them with the following questions. Tell students to answer the questions citing evidence from the text in order to support their answers. Remind them to include page numbers.

- (1) What are threats to the safety of the black rhinoceros species? How are these threats?
- (2) What was Rachel Santymire’s purpose for going to Addo Elephant National Park? Why did she want to do this?
- (3) How have black rhinos adapted to their environment in Addo Elephant National Park? What does this suggest?
- (4) What are “middens”? How were they significant to Rachel and her team?
- (5) How does Rachel use the rhinos’ poop?
- (6) Why is it important that Rachel and her team recover the feces samples within 24 hours of them being deposited?
- (7) What is the significance of hormones in the feces samples?
- (8) How does Rachel use her discoveries to help Lincoln Park Zoo’s black rhinoceros conservation plan?
- (9) How does Lincoln Park Zoo connect its visitors to Rachel’s work?
- (10) What does the chapter title mean?
- (11) What more did you learn about black rhinos from reading this chapter?

CCSS Anchor Standards

R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.



Lesson Plan - Chapter Three: Feces Saves Species

Understanding Text Features

Have students reread Chapter Three. Have them complete the following table in order to identify text features from the text. Review concepts as needed.

Text Feature:	Page Numbers:	Content Included:	Purpose:
Chapter Title	37	Feces Save Species	Give the reader a sense of what the chapter will be about
Fact Box			
Map			
Table			
Photographs/Captions			

Engage students by asking them the following questions: “What is the purpose of each text features (e.g. Table of Contents, etc.)? How do text features help readers understand what they are reading? How did the author use text features?”

Comparing and Contrasting

Assign students to work in groups of three. Have them complete the following table using text-based evidence.

	Meredith Bastian	Jeff Baughman	Rachel Santymire
What is the focus of their conservation work?			
How have they contributed to their areas of conservation?			

After completing the table, have students write an informational paragraph in which they respond to the following prompt: *Choose two of the zoo scientists you described in the table. Using evidence from the text, write an informational paragraph in which you compare the two zoo scientists’ conservation work and their overall contributions to their field.* Provide students with a paragraph frame if needed.

CCSS Anchor Standards

R.1 Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

R.5 Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.

R.9 Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.



Chapter Three: Feces Saves Species

Text Feature Table

Sample Answers:

Text Feature:	Page Numbers:	Content Included:	Purpose:
Chapter Title	37	Feces Save Species	Provides the reader with the topic of the chapter
Fact Box	38, 49	Wanted! (information about poachers); Saving Wildlife: The Red List (information about the IUCN's Red List)	Provides additional information beyond what is written in the main portion of the text

Chapter Three: Feces Saves Species

Compare and Contrast Table

Sample Answers:

	Meredith Bastian	Jeff Baughman	Rachel Santymire
What is the focus of their conservation work?	Orangutans	Black-footed ferrets	Black rhinoceroses
How have they contributed to their areas of conservation?	Provided information about orangutans and spread awareness about palm oil	Breeds ferrets and releases them into the wild	Discovered how to track rhino hormones in the wild; baby rhino was born at Lincoln Park Zoo



Some online resources with additional information:

<https://www.worldwildlife.org/>
www.saynotopalmoil.com
www.rhinos.org

www.nationalgeographic.com
www.orangutan.org
www.blackfootedferret.org

Lesson Plan - Chapter Four: The Rest of the Story

Examining Author's Methods

Review points-of-view in writing. Complete this chart:

Point of View	What is it?	Examples
First Person		
Second Person		
Third Person		

Have students reread the final two paragraphs on page 56. Ask students: “What is the point-of-view? What is the author’s purpose in using a second-person point-of-view? Is it effective? Why or why not?” Ask students: “When is it appropriate for authors to use second-person point-of-view?”

Using this passage as a mentor text, have students write their own text using second-person point-of-view.

Researching and Creating A Persuasive Text

After reading *Zoo Scientists to the Rescue*, ask students: “How did this text change you? How did it pull you in emotionally? How did it persuade you?” Have students work in groups of four to choose one area of conservation to research further. Have students research additional information in order to create a Public Service Announcement (PSA) using an online/video tool. (If needed, define PSA and review examples.) Make sure students keep their message short, brief, and to the point. Tell them to persuade their audiences to their causes.

Have students share their projects by posting to classroom blog, website, social media, etc. Remind them to use hashtag #ProtectOurWorld. If possible, host a Film Festival in which the PSA videos are shown to a larger in-person audience. Have students respond to each other by answering this question: “How did the PSA persuade you?”

CCSS Anchor Standards

R.7 Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words

R.9 Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

W.8 Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.

SL.2 Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.



About the Curriculum Designers:

Maggi Chiodo, Holly Daquila, and Erin Springer are all board members of Aztecs For Education (AFE), an organization for Teachers-Leaders and Teacher-Candidates in San Diego State University’s highly ranked College of Education. AFE aims to make a difference in the community through outreach programs. At the time of this publication, Maggi Chiodo was a third grade teacher in San Diego County. Holly Daquila and Erin Springer were distinguished Student Teachers completing their last semester in SDSU’s Multiple Subject Three-Semester Block credential program. Dr. Virginia Loh-Hagan proudly serves as AFE’s Faculty Advisor. She is a curriculum designer, university professor/teacher educator, published author (Sleeping Bear Press, Cherry Lake Publishing/45th Parallel, Guilford Press), former K-8 classroom teacher, and educational consultant. She’s directing the Liberal Studies program and Clinical Practices for SDSU’s School of Teacher Education. She serves on several book award committees and is the Cover Editor and columnist for *The California Reader*.